

THERMOCOUPLE / RTD TABLES

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ROCHESTER, N.Y. U.S.A.

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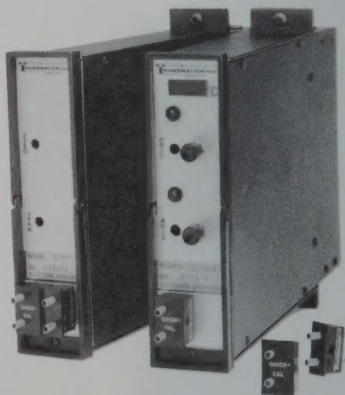


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TEMPERATURE - ELECTROMOTIVE FORCE (EMF) TABLES FOR THERMOCOUPLES¹

This reference manual consists of reference tables that give temperature-electromotive force (emf) relationships for Types B, E, J, K, R, S, and T thermocouples. These are the thermocouple types most commonly used in industry.

These tables give emf values to three decimal places (1 μV) for each degree of temperature. Such tables are satisfactory for most industrial uses but may not be adequate for computer and similar applications. If greater precision is required, the reader should refer to the NBS reference noted below which also includes tables giving emf values to four decimal places (0.1 μV) as well as equations which permit easy and unique generation of the temperature-emf relationships.

¹ All temperature — electromotive force data in Tables 3 to 16 have been extracted from "Thermocouple Reference Tables Based on the IPTS-68" *National Bureau of Standards Monograph 125*.

List of Tables

Following is a list of the tables included in this reference manual:

Table Number	Thermocouple Type	Thermoelement Type	Temperature Range ^a
1	Limits of error for thermocouples		
2	Recommended upper temperature limits for protected thermocouples		
3	B		0 to 3308 F
4	B		0 to 1820 C
5	E		-454 to 1832 F
6	E		-270 to 1000 C
7	J		-350 to 2192 F
8	J		-210 to 1200 C
9	K		-454 to 2500 F
10	K		-270 to 1372 C
11	R		-58 to 3214 F
12	R		-50 to 1768 C
13	S		-58 to 3214 F
14	S		-50 to 1768 C
15	T		-454 to 752 F
16	T		-270 to 400 C

TABLE 1 Limits of Error for Thermocouples

Type	Temperature Range		Limits of Error			
			Standard		Special	
	deg F	deg C	deg F	deg C	deg F	deg C
B	1600 to 3100	871 to 1705	$\pm \frac{1}{2}$ percent			
E	32 to 600	0 to 316	± 3 F		$\pm 2\frac{1}{4}$ F	
J	600 to 1600	316 to 871	$\pm \frac{1}{2}$ percent		$\pm \frac{1}{8}$ percent	
	32 to 530	0 to 277	± 4 F	Note 2	± 2 F	Note 2
K	530 to 1400	277 to 760	$\pm \frac{3}{4}$ percent		$\pm \frac{3}{8}$ percent	
	32 to 530	0 to 277	± 4 F		± 2 F	
R or S	530 to 2300	277 to 1260	$\pm \frac{3}{4}$ percent		$\pm \frac{1}{8}$ percent	
	32 to 1000	0 to 538	$\pm 2\frac{1}{2}$ F			
T	1000 to 2700	538 to 1482	$\pm \frac{1}{4}$ percent			
	-300 to -75	-184 to -59			± 1 percent	
	-150 to -75	-101 to -59	± 2 percent		± 1 percent	
	-75 to +200	-59 to +93	$\pm 1\frac{1}{2}$ F		$\pm \frac{1}{4}$ F	
	200 to 700	+93 to +371	$\pm \frac{3}{4}$ percent		$\pm \frac{3}{8}$ percent	

TABLE 2 Recommended Upper Temperature Limits for Protected Thermocouples

Upper Temperature Limit for Various Wire Sizes (Awg), deg F (deg C)					
Thermocouple Type	No. 8 Gage (0.128 in. (3.25 mm))	No. 14 Gage (0.064 in. (1.63 mm))	No. 20 Gage (0.032 in. (0.81 mm))	No. 24 Gage (0.020 in. (0.51 mm))	No. 28 Gage (0.013 in. (0.33 mm))
B				3100 (1705)	
E	1600 (871)	1200 (649)	1000 (538)	800 (427)	800 (427)
J	1400 (760)	1100 (593)	900 (482)	1700 (371)	700 (371)
K	2300 (1260)	2000 (1093)	1800 (982)	1600 (871)	1600 (871)
R and S				2700 (1482)	
T		700 (371)	500 (260)	400 (204)	400 (204)

TABLE 3 Type B Thermocouples
Temperature in Degrees Fahrenheit*

EMF in Absolute Millivolts												Reference Junctions at 32 F	
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F	
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS													
0	0.006	0.006	0.006	0.006	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0	
10	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	10	
20	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	20	
30	0.000	0.000	0.000	-0.000	-0.000	-0.000	-0.001	-0.001	-0.001	-0.001	-0.001	30	
40	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.002	-0.002	-0.002	-0.002	-0.002	40	
50	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	50	
60	-0.002	-0.002	-0.002	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	60	
70	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.002	-0.002	-0.002	-0.002	70	
80	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	80	
90	-0.002	-0.002	-0.002	-0.002	-0.002	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	90	
100	-0.001	-0.001	-0.001	-0.001	-0.000	-0.000	-0.000	-0.000	0.000	0.000	0.000	100	
110	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	110	
120	0.002	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.003	0.004	0.004	120	
130	0.004	0.004	0.004	0.005	0.005	0.005	0.005	0.005	0.006	0.006	0.006	130	
140	0.006	0.006	0.007	0.007	0.007	0.007	0.008	0.008	0.008	0.009	0.009	140	
150	0.009	0.009	0.009	0.010	0.010	0.010	0.011	0.011	0.011	0.012	0.012	150	
160	0.012	0.012	0.013	0.013	0.013	0.014	0.014	0.014	0.015	0.015	0.015	160	
170	0.015	0.016	0.016	0.016	0.017	0.017	0.017	0.018	0.018	0.019	0.019	170	
180	0.019	0.019	0.020	0.020	0.021	0.021	0.021	0.022	0.022	0.023	0.023	180	
190	0.023	0.023	0.024	0.024	0.025	0.025	0.026	0.026	0.027	0.027	0.027	190	
200	0.027	0.028	0.028	0.029	0.029	0.030	0.030	0.031	0.031	0.032	0.032	200	
210	0.032	0.033	0.033	0.034	0.034	0.035	0.035	0.036	0.036	0.037	0.037	210	
220	0.037	0.038	0.038	0.039	0.039	0.040	0.041	0.041	0.042	0.042	0.043	220	
230	0.043	0.043	0.044	0.044	0.045	0.046	0.046	0.047	0.047	0.048	0.049	230	
240	0.049	0.049	0.050	0.050	0.051	0.052	0.052	0.053	0.053	0.054	0.055	240	
250	0.055	0.055	0.056	0.057	0.057	0.058	0.058	0.059	0.060	0.060	0.061	250	
260	0.061	0.062	0.062	0.063	0.064	0.064	0.065	0.066	0.067	0.067	0.068	260	
270	0.068	0.069	0.069	0.070	0.071	0.071	0.072	0.073	0.074	0.074	0.075	270	
280	0.075	0.076	0.077	0.077	0.078	0.079	0.080	0.080	0.081	0.082	0.083	280	
290	0.083	0.083	0.084	0.085	0.086	0.086	0.087	0.088	0.089	0.090	0.090	290	
300	0.090	0.091	0.092	0.093	0.094	0.094	0.095	0.096	0.097	0.098	0.099	300	
310	0.099	0.099	0.100	0.101	0.102	0.103	0.104	0.104	0.105	0.106	0.107	310	
320	0.107	0.108	0.109	0.110	0.111	0.111	0.112	0.113	0.114	0.115	0.116	320	
330	0.116	0.117	0.118	0.119	0.120	0.120	0.121	0.122	0.123	0.124	0.125	330	
340	0.125	0.126	0.127	0.128	0.129	0.130	0.131	0.132	0.133	0.134	0.135	340	
350	0.135	0.136	0.137	0.138	0.138	0.139	0.140	0.141	0.142	0.143	0.144	350	
360	0.144	0.145	0.146	0.147	0.148	0.149	0.151	0.152	0.153	0.154	0.155	360	
370	0.155	0.156	0.157	0.158	0.159	0.160	0.161	0.162	0.163	0.164	0.165	370	
380	0.165	0.166	0.167	0.168	0.169	0.171	0.172	0.173	0.174	0.175	0.176	380	
390	0.176	0.177	0.178	0.179	0.180	0.182	0.183	0.184	0.185	0.186	0.187	390	
400	0.187	0.188	0.189	0.191	0.192	0.193	0.194	0.195	0.196	0.197	0.199	400	
410	0.199	0.200	0.201	0.202	0.203	0.205	0.206	0.207	0.208	0.209	0.210	410	
420	0.210	0.212	0.213	0.214	0.215	0.217	0.218	0.219	0.220	0.221	0.223	420	
430	0.223	0.224	0.225	0.226	0.228	0.229	0.230	0.231	0.233	0.234	0.235	430	
440	0.235	0.236	0.238	0.239	0.240	0.242	0.243	0.244	0.245	0.247	0.248	440	
450	0.248	0.249	0.251	0.252	0.253	0.254	0.256	0.257	0.258	0.260	0.261	450	
460	0.261	0.262	0.264	0.265	0.266	0.268	0.269	0.271	0.272	0.273	0.275	460	
470	0.275	0.276	0.277	0.279	0.280	0.281	0.283	0.284	0.286	0.287	0.288	470	
480	0.288	0.290	0.291	0.293	0.294	0.295	0.297	0.298	0.300	0.301	0.303	480	
490	0.303	0.304	0.305	0.307	0.308	0.310	0.311	0.313	0.314	0.315	0.317	490	
500	0.317	0.318	0.320	0.321	0.323	0.324	0.326	0.327	0.329	0.330	0.332	500	
510	0.332	0.333	0.335	0.336	0.338	0.339	0.341	0.342	0.344	0.345	0.347	510	
520	0.347	0.348	0.350	0.351	0.353	0.355	0.356	0.358	0.359	0.361	0.362	520	
530	0.362	0.364	0.365	0.367	0.369	0.370	0.372	0.373	0.375	0.376	0.378	530	
540	0.378	0.380	0.381	0.383	0.384	0.386	0.388	0.389	0.391	0.392	0.394	540	
550	0.394	0.396	0.397	0.399	0.401	0.402	0.404	0.405	0.407	0.409	0.410	550	
560	0.410	0.412	0.414	0.415	0.417	0.419	0.420	0.422	0.424	0.425	0.427	560	
570	0.427	0.429	0.431	0.432	0.434	0.436	0.437	0.439	0.441	0.442	0.444	570	
580	0.444	0.446	0.448	0.449	0.451	0.453	0.455	0.456	0.458	0.460	0.462	580	
590	0.462	0.463	0.465	0.467	0.469	0.470	0.472	0.474	0.476	0.477	0.479	590	
600	0.479	0.481	0.483	0.485	0.486	0.488	0.490	0.492	0.494	0.495	0.497	600	
610	0.497	0.499	0.501	0.503	0.504	0.506	0.508	0.510	0.512	0.514	0.515	610	
620	0.515	0.517	0.519	0.521	0.523	0.525	0.527	0.528	0.530	0.532	0.534	620	
630	0.534	0.536	0.538	0.540	0.542	0.544	0.545	0.547	0.549	0.551	0.553	630	
640	0.553	0.555	0.557	0.559	0.561	0.563	0.565	0.566	0.568	0.570	0.572	640	

DEG F 0 1 2 3 4 5 6 7 8 9 10 DEG F
* Converted from degrees Celsius (IPTS 1968)

TABLE 3 Type B Thermocouples Continued

Temperature in Degrees Fahrenheit*

EMF in Absolute Millivolts

Reference Junctions at 32 F

DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
650	0.572	0.574	0.576	0.578	0.580	0.582	0.584	0.586	0.588	0.590	0.592	650
660	0.592	0.594	0.596	0.598	0.600	0.602	0.604	0.606	0.608	0.610	0.612	660
670	0.612	0.614	0.616	0.618	0.620	0.622	0.624	0.626	0.628	0.630	0.632	670
680	0.632	0.634	0.636	0.638	0.640	0.642	0.644	0.646	0.648	0.650	0.652	680
690	0.652	0.654	0.656	0.658	0.661	0.663	0.665	0.667	0.669	0.671	0.673	690
700	0.673	0.675	0.677	0.679	0.682	0.684	0.686	0.688	0.690	0.692	0.694	700
710	0.694	0.696	0.699	0.701	0.703	0.705	0.707	0.709	0.711	0.714	0.716	710
720	0.716	0.718	0.720	0.722	0.724	0.727	0.729	0.731	0.733	0.735	0.737	720
730	0.737	0.740	0.742	0.744	0.746	0.748	0.751	0.753	0.755	0.757	0.759	730
740	0.759	0.762	0.764	0.766	0.768	0.771	0.773	0.775	0.777	0.780	0.782	740
750	0.782	0.784	0.786	0.789	0.791	0.793	0.795	0.798	0.800	0.802	0.804	750
760	0.804	0.807	0.809	0.811	0.814	0.816	0.818	0.821	0.823	0.825	0.827	760
770	0.827	0.830	0.832	0.834	0.837	0.839	0.841	0.844	0.846	0.848	0.851	770
780	0.851	0.853	0.855	0.858	0.860	0.862	0.865	0.867	0.870	0.872	0.874	780
790	0.874	0.877	0.879	0.881	0.884	0.886	0.889	0.891	0.893	0.896	0.898	790
800	0.898	0.901	0.903	0.905	0.908	0.910	0.913	0.915	0.918	0.920	0.922	800
810	0.922	0.925	0.927	0.930	0.932	0.935	0.937	0.939	0.942	0.944	0.947	810
820	0.947	0.949	0.952	0.954	0.957	0.959	0.962	0.964	0.967	0.969	0.972	820
830	0.972	0.974	0.977	0.979	0.982	0.984	0.987	0.989	0.992	0.994	0.997	830
840	0.997	0.999	1.002	1.004	1.007	1.009	1.012	1.014	1.017	1.020	1.022	840
850	1.022	1.025	1.027	1.030	1.032	1.035	1.037	1.040	1.043	1.045	1.048	850
860	1.048	1.050	1.053	1.056	1.058	1.061	1.063	1.066	1.069	1.071	1.074	860
870	1.074	1.076	1.079	1.082	1.084	1.087	1.090	1.092	1.095	1.097	1.100	870
880	1.100	1.102	1.105	1.108	1.111	1.113	1.116	1.119	1.121	1.124	1.127	880
890	1.127	1.129	1.132	1.135	1.137	1.140	1.143	1.145	1.148	1.151	1.153	890
900	1.153	1.156	1.159	1.162	1.164	1.167	1.170	1.172	1.175	1.178	1.181	900
910	1.181	1.183	1.186	1.189	1.192	1.194	1.197	1.200	1.203	1.205	1.208	910
920	1.208	1.211	1.214	1.216	1.219	1.222	1.225	1.228	1.230	1.233	1.236	920
930	1.236	1.239	1.241	1.244	1.247	1.250	1.253	1.255	1.258	1.261	1.264	930
940	1.264	1.267	1.270	1.272	1.275	1.278	1.281	1.284	1.287	1.289	1.292	940
950	1.292	1.295	1.298	1.301	1.304	1.307	1.309	1.312	1.315	1.318	1.321	950
960	1.321	1.324	1.327	1.330	1.332	1.335	1.338	1.341	1.344	1.347	1.350	960
970	1.350	1.353	1.356	1.359	1.361	1.364	1.367	1.370	1.373	1.376	1.379	970
980	1.379	1.382	1.385	1.388	1.391	1.394	1.397	1.400	1.403	1.406	1.409	980
990	1.409	1.411	1.414	1.417	1.420	1.423	1.426	1.429	1.432	1.435	1.438	990
1.000	1.438	1.441	1.444	1.447	1.450	1.453	1.456	1.459	1.462	1.465	1.468	1.000
1.010	1.468	1.471	1.474	1.477	1.480	1.483	1.487	1.490	1.493	1.496	1.499	1.010
1.020	1.499	1.502	1.505	1.508	1.511	1.514	1.517	1.520	1.523	1.526	1.529	1.020
1.030	1.529	1.532	1.536	1.539	1.542	1.545	1.548	1.551	1.554	1.557	1.560	1.030
1.040	1.560	1.563	1.566	1.570	1.573	1.576	1.579	1.582	1.585	1.588	1.591	1.040
1.050	1.591	1.595	1.598	1.601	1.604	1.607	1.610	1.613	1.617	1.620	1.623	1.050
1.060	1.623	1.625	1.629	1.632	1.636	1.639	1.642	1.645	1.648	1.652	1.655	1.060
1.070	1.655	1.658	1.661	1.664	1.668	1.671	1.674	1.677	1.680	1.684	1.687	1.070
1.080	1.687	1.690	1.693	1.696	1.700	1.703	1.705	1.709	1.713	1.716	1.719	1.080
1.090	1.719	1.722	1.726	1.729	1.732	1.735	1.739	1.742	1.745	1.748	1.752	1.090
1.100	1.752	1.755	1.758	1.762	1.765	1.768	1.771	1.775	1.778	1.781	1.785	1.100
1.110	1.785	1.788	1.791	1.795	1.798	1.801	1.804	1.808	1.811	1.814	1.818	1.110
1.120	1.818	1.821	1.824	1.828	1.831	1.834	1.838	1.841	1.844	1.848	1.851	1.120
1.130	1.851	1.855	1.858	1.861	1.865	1.868	1.871	1.875	1.878	1.882	1.885	1.130
1.140	1.885	1.888	1.892	1.895	1.898	1.902	1.905	1.909	1.912	1.915	1.919	1.140
1.150	1.919	1.922	1.926	1.929	1.933	1.936	1.939	1.943	1.946	1.950	1.953	1.150
1.160	1.953	1.957	1.960	1.963	1.967	1.970	1.974	1.977	1.981	1.984	1.988	1.160
1.170	1.988	1.991	1.995	1.998	2.002	2.005	2.009	2.012	2.015	2.019	2.022	1.170
1.180	2.022	2.026	2.029	2.033	2.036	2.040	2.043	2.047	2.051	2.054	2.058	1.180
1.190	2.058	2.061	2.065	2.068	2.072	2.075	2.079	2.082	2.086	2.089	2.093	1.190
1.200	2.093	2.096	2.100	2.104	2.107	2.111	2.114	2.118	2.121	2.125	2.128	1.200
1.210	2.128	2.132	2.136	2.139	2.143	2.146	2.150	2.154	2.157	2.161	2.164	1.210
1.220	2.164	2.168	2.172	2.175	2.179	2.182	2.186	2.190	2.193	2.197	2.201	1.220
1.230	2.201	2.204	2.208	2.211	2.215	2.219	2.222	2.226	2.230	2.233	2.237	1.230
1.240	2.237	2.241	2.244	2.248	2.252	2.255	2.259	2.263	2.266	2.270	2.274	1.240
1.250	2.274	2.277	2.281	2.285	2.288	2.292	2.296	2.299	2.303	2.307	2.311	1.250
1.260	2.311	2.314	2.318	2.322	2.325	2.329	2.333	2.337	2.340	2.344	2.348	1.260
1.270	2.348	2.351	2.355	2.359	2.363	2.366	2.370	2.374	2.378	2.381	2.385	1.270
1.280	2.385	2.388	2.393	2.396	2.400	2.404	2.408	2.412	2.415	2.419	2.423	1.280
1.290	2.423	2.427	2.430	2.434	2.438	2.442	2.446	2.449	2.453	2.457	2.461	1.290
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F

* Converted from degrees Celsius (IPTS 1968).

TABLE 3 Type B Thermocouples Continued

Temperature in Degrees Fahrenheit*

EMF in Absolute Millivolts

Reference Junctions at 32 F

DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
1.300	2.461	2.465	2.469	2.472	2.476	2.480	2.484	2.488	2.491	2.495	2.499	1.300
1.310	2.499	2.503	2.507	2.511	2.515	2.518	2.522	2.526	2.530	2.534	2.538	1.310
1.320	2.538	2.542	2.545	2.549	2.553	2.557	2.561	2.565	2.569	2.573	2.576	1.320
1.330	2.576	2.580	2.584	2.588	2.592	2.596	2.600	2.604	2.608	2.612	2.615	1.330
1.340	2.615	2.619	2.623	2.627	2.631	2.635	2.639	2.643	2.647	2.651	2.655	1.340
1.350	2.655	2.659	2.663	2.667	2.670	2.674	2.678	2.682	2.686	2.690	2.694	1.350
1.360	2.694	2.698	2.702	2.706	2.710	2.714	2.718	2.722	2.726	2.730	2.734	1.360
1.370	2.734	2.738	2.742	2.746	2.750	2.754	2.758	2.762	2.766	2.770	2.774	1.370
1.380	2.774	2.778	2.782	2.786	2.790	2.794	2.798	2.802	2.806	2.810	2.814	1.380
1.390	2.814	2.818	2.822	2.826	2.830	2.835	2.839	2.843	2.847	2.851	2.855	1.390
1.400	2.855	2.859	2.863	2.867	2.871	2.875	2.879	2.883	2.887	2.892	2.896	1.400
1.410	2.896	2.900	2.904	2.908	2.912	2.916	2.920	2.924	2.928	2.933	2.937	1.410
1.420	2.937	2.941	2.945	2.949	2.953	2.957	2.961	2.966	2.970	2.974	2.978	1.420
1.430	2.978	2.982	2.986	2.990	2.995	2.999	3.003	3.007	3.011	3.015	3.019	1.430
1.440	3.019	3.024	3.028	3.032	3.036	3.040	3.045	3.049	3.053	3.057	3.061	1.440
1.450	3.061	3.065	3.070	3.074	3.078	3.082	3.086	3.091	3.095	3.099	3.103	1.450
1.460	3.103	3.107	3.112	3.116	3.120	3.124	3.129	3.133	3.137	3.141	3.146	1.460
1.470	3.146	3.150	3.154	3.158	3.163	3.167	3.171	3.175	3.180	3.184	3.188	1.470
1.480	3.188	3.192	3.197	3.201	3.205	3.209	3.214	3.218	3.222	3.227	3.231	1.480
1.490	3.231	3.235	3.239	3.244	3.248	3.252	3.257	3.261	3.265	3.269	3.274	1.490
1.500	3.274	3.278	3.282	3.287	3.291	3.295	3.300	3.304	3.308	3.313	3.317	1.500
1.510	3.317	3.321	3.326	3.330	3.334	3.339	3.343	3.347	3.352	3.356	3.361	1.510
1.520	3.361	3.365	3.369	3.374	3.378	3.382	3.387	3.391	3.395	3.400	3.404	1.520
1.530	3.404	3.409	3.413	3.417	3.422	3.426	3.431	3.435	3.439	3.444	3.448	1.530
1.540	3.448	3.453	3.457	3.461	3.466	3.470	3.475	3.479	3.484	3.488	3.492	1.540
1.550	3.492	3.497	3.501	3.506	3.510	3.515	3.519	3.523	3.528	3.532	3.537	1.550
1.560	3.537	3.541	3.546	3.550	3.555	3.559	3.564	3.568	3.573	3.577	3.581	1.560
1.570	3.581	3.586	3.590	3.595	3.599	3.604	3.608	3.613	3.617	3.622	3.626	1.570
1.580	3.626	3.631	3.635	3.640	3.644	3.649	3.653	3.658	3.662	3.667	3.672	1.580
1.590	3.672	3.676	3.681	3.685	3.690	3.694	3.699	3.703	3.708	3.712	3.717	1.590
1.600	3.717	3.721	3.726	3.731	3.735	3.740	3.744	3.749	3.753	3.758	3.762	1.600
1.610	3.762	3.767	3.772	3.776	3.781	3.785	3.790	3.795	3.799	3.804	3.808	1.610
1.620	3.808	3.813	3.818	3.822	3.827	3.831	3.836	3.841	3.845	3.850	3.854	1.620
1.630	3.854	3.859	3.864	3.868	3.873	3.877	3.882	3.887	3.891	3.896	3.901	1.630
1.640	3.901	3.905	3.910	3.915	3.919	3.924	3.929	3.933	3.938	3.943	3.947	1.640
1.650	3.947	3.952	3.957	3.961	3.966	3.971	3.975	3.980	3.985	3.989	3.994	1.650
1.660	3.994	3.999	4.003	4.008	4.013	4.017	4.022	4.027	4.031	4.036	4.041	1.660
1.670	4.041	4.046	4.050	4.055	4.060	4.064	4.069	4.074	4.079	4.083	4.088	1.670
1.680	4.088	4.093	4.098	4.102	4.107	4.112	4.117	4.121	4.126	4.131	4.136	1.680
1.690	4.136	4.140	4.145	4.150	4.155	4.159	4.164	4.169	4.174	4.178	4.183	1.690
1.700	4.183	4.188	4.193	4.198	4.202	4.207	4.212	4.217	4.221	4.226	4.231	1.700
1.710	4.231	4.236	4.241	4.245	4.250	4.255	4.260	4.265	4.269	4.274	4.279	1.710
1.720	4.279	4.284	4.289	4.294	4.298	4.303	4.308	4.313	4.318	4.323	4.327	1.720
1.730	4.327	4.332	4.337	4.342	4.347	4.352	4.357	4.361	4.366	4.371	4.376	1.730
1.740	4.376	4.381	4.386	4.391	4.395	4.400	4.405	4.410	4.415	4.420	4.425	1.740
1.750	4.425	4.430	4.435	4.439	4.444	4.449	4.454	4.459	4.464	4.469	4.474	1.750
1.760	4.474	4.479	4.484	4.488	4.493	4.498	4.503	4.508	4.513	4.518	4.523	1.760
1.770	4.523	4.528	4.533	4.538	4.543	4.548	4.552	4.557	4.562	4.567	4.572	1.770
1.780	4.572	4.577	4.582	4.587	4.592	4.597	4.602	4.607	4.612	4.617	4.622	1.780
1.790	4.622	4.627	4.632	4.637	4.642	4.647	4.652	4.657	4.662	4.667	4.672	1.790
1.800	4.672	4.677	4.682	4.687	4.692	4.697	4.702	4.707	4.712	4.717	4.722	1.800
1.810	4.722	4.727	4.732	4.737	4.742	4.747	4.752	4.757	4.762	4.767	4.772	1.810
1.820	4.772	4.777	4.782	4.787	4.792	4.797	4.802	4.807	4.812	4.817	4.823	1.820
1.830	4.823	4.828	4.833	4.838	4.843	4.848	4.853	4.858	4.863	4.868	4.873	1.830
1.840	4.873	4.878	4.883	4.888	4.894	4.899	4.904	4.909	4.914	4.919	4.924	1.840
1.850	4.924	4.929	4.934	4.939	4.945	4.950	4.955	4.960	4.965	4.970	4.975	1.850
1.860	4.975	4.980	4.985	4.991	4.996	5.001	5.006	5.011	5.016	5.021	5.027	1.860
1.870	5.027	5.032	5.037	5.042	5.047	5.052	5.057	5.063	5.068	5.073	5.078	1.870
1.880	5.078	5.083	5.088	5.094	5.099	5.104	5.109	5.114	5.119	5.125	5.130	1.880
1.890	5.130	5.135	5.140	5.145	5.150	5.156	5.161	5.166	5.171	5.176	5.182	1.890
1.900	5.182	5.187	5.192	5.197	5.202	5.208	5.213	5.218	5.223	5.229	5.234	1.900
1.910	5.234	5.239	5.244	5.249	5.255	5.260	5.265	5.270	5.276	5.281	5.286	1.910
1.920	5.286	5.291	5.297	5.302	5.307	5.312	5.318	5.323	5.328	5.333	5.339	1.920
1.930	5.339	5.344	5.349	5.354	5.360	5.365	5.370	5.376	5.381	5.386	5.391	1.930
1.940	5.391	5.397	5.402	5.407	5.413	5.418	5.423	5.428	5.434	5.439	5.444	1.940

DEG F 0 1 2 3 4 5 6 7 8 9 10 DEG F

* Converted from degrees Celsius (IPTS 1968).

TABLE 3 Type B Thermocouples Continued

Temperature in Degrees Fahrenheit*

EMF in Absolute Millivolts

Reference Junctions at 32 F

DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
1,950	5.444	5.450	5.455	5.460	5.466	5.471	5.476	5.482	5.487	5.492	5.497	1,950
1,960	5.497	5.503	5.508	5.513	5.519	5.524	5.529	5.535	5.540	5.545	5.551	1,960
1,970	5.551	5.556	5.561	5.567	5.572	5.578	5.583	5.588	5.594	5.599	5.604	1,970
1,980	5.604	5.610	5.615	5.620	5.626	5.631	5.637	5.642	5.647	5.653	5.658	1,980
1,990	5.658	5.663	5.669	5.674	5.680	5.685	5.690	5.696	5.701	5.707	5.712	1,990
2,000	5.712	5.717	5.723	5.728	5.734	5.739	5.744	5.750	5.755	5.761	5.766	2,000
2,010	5.766	5.771	5.777	5.782	5.788	5.793	5.799	5.804	5.810	5.815	5.820	2,010
2,020	5.820	5.826	5.831	5.837	5.842	5.848	5.853	5.859	5.864	5.869	5.875	2,020
2,030	5.875	5.880	5.886	5.891	5.897	5.902	5.908	5.913	5.919	5.924	5.930	2,030
2,040	5.930	5.935	5.941	5.946	5.951	5.957	5.962	5.968	5.973	5.979	5.984	2,040
2,050	5.984	5.990	5.995	5.996	6.006	6.012	6.017	6.023	6.028	6.034	6.039	2,050
2,060	6.039	6.045	6.051	6.056	6.062	6.067	6.073	6.078	6.084	6.089	6.095	2,060
2,070	6.095	6.100	6.106	6.111	6.117	6.122	6.128	6.134	6.139	6.145	6.150	2,070
2,080	6.150	6.156	6.161	6.167	6.172	6.178	6.184	6.189	6.195	6.200	6.206	2,080
2,090	6.206	6.211	6.217	6.223	6.228	6.234	6.239	6.245	6.250	6.256	6.262	2,090
2,100	6.262	6.267	6.273	6.278	6.284	6.290	6.295	6.301	6.306	6.312	6.318	2,100
2,110	6.318	6.323	6.329	6.334	6.340	6.346	6.351	6.357	6.362	6.368	6.374	2,110
2,120	6.374	6.379	6.385	6.391	6.396	6.402	6.408	6.413	6.419	6.424	6.430	2,120
2,130	6.430	6.436	6.441	6.447	6.453	6.458	6.464	6.470	6.475	6.481	6.487	2,130
2,140	6.487	6.492	6.498	6.504	6.509	6.515	6.521	6.526	6.532	6.538	6.543	2,140
2,150	6.543	6.549	6.555	6.560	6.566	6.572	6.577	6.583	6.589	6.594	6.600	2,150
2,160	6.600	6.606	6.612	6.617	6.623	6.629	6.634	6.640	6.646	6.651	6.657	2,160
2,170	6.657	6.663	6.669	6.676	6.680	6.686	6.692	6.697	6.703	6.709	6.714	2,170
2,180	6.714	6.720	6.726	6.732	6.737	6.743	6.749	6.755	6.760	6.766	6.772	2,180
2,190	6.772	6.778	6.783	6.789	6.795	6.801	6.806	6.812	6.818	6.824	6.829	2,190
2,200	6.829	6.835	6.841	6.847	6.852	6.858	6.864	6.870	6.876	6.881	6.887	2,200
2,210	6.887	6.893	6.899	6.904	6.910	6.916	6.922	6.928	6.933	6.939	6.945	2,210
2,220	6.945	6.951	6.957	6.962	6.968	6.974	6.980	6.986	6.991	6.997	7.003	2,220
2,230	7.003	7.009	7.015	7.021	7.026	7.032	7.038	7.044	7.050	7.055	7.061	2,230
2,240	7.061	7.067	7.073	7.079	7.085	7.090	7.096	7.102	7.108	7.114	7.120	2,240
2,250	7.120	7.126	7.131	7.137	7.143	7.149	7.155	7.161	7.167	7.172	7.178	2,250
2,260	7.178	7.184	7.190	7.196	7.202	7.208	7.213	7.219	7.225	7.231	7.237	2,260
2,270	7.237	7.243	7.249	7.255	7.260	7.266	7.272	7.278	7.284	7.290	7.296	2,270
2,280	7.296	7.302	7.308	7.314	7.319	7.325	7.331	7.337	7.343	7.349	7.355	2,280
2,290	7.355	7.361	7.367	7.373	7.378	7.384	7.390	7.396	7.402	7.408	7.414	2,290
2,300	7.414	7.420	7.426	7.432	7.438	7.444	7.450	7.456	7.461	7.467	7.473	2,300
2,310	7.473	7.479	7.485	7.491	7.497	7.503	7.509	7.515	7.521	7.527	7.533	2,310
2,320	7.533	7.539	7.545	7.551	7.557	7.563	7.569	7.575	7.581	7.587	7.593	2,320
2,330	7.593	7.599	7.604	7.610	7.616	7.622	7.628	7.634	7.640	7.646	7.652	2,330
2,340	7.652	7.658	7.664	7.670	7.676	7.682	7.688	7.694	7.700	7.706	7.712	2,340
2,350	7.712	7.718	7.724	7.730	7.736	7.742	7.748	7.754	7.760	7.766	7.772	2,350
2,360	7.772	7.778	7.784	7.790	7.796	7.802	7.808	7.814	7.820	7.827	7.833	2,360
2,370	7.833	7.839	7.845	7.851	7.857	7.863	7.869	7.875	7.881	7.887	7.893	2,370
2,380	7.893	7.899	7.905	7.911	7.917	7.923	7.929	7.935	7.941	7.947	7.953	2,380
2,390	7.953	7.959	7.966	7.972	7.978	7.984	7.990	7.996	8.002	8.008	8.014	2,390
2,400	8.014	8.020	8.026	8.032	8.038	8.044	8.051	8.057	8.063	8.069	8.075	2,400
2,410	8.075	8.081	8.087	8.093	8.099	8.105	8.111	8.118	8.124	8.130	8.136	2,410
2,420	8.136	8.142	8.148	8.154	8.160	8.166	8.172	8.179	8.185	8.191	8.197	2,420
2,430	8.197	8.203	8.209	8.215	8.221	8.227	8.234	8.240	8.246	8.252	8.258	2,430
2,440	8.258	8.264	8.270	8.276	8.283	8.289	8.295	8.301	8.307	8.313	8.319	2,440
2,450	8.319	8.326	8.332	8.338	8.344	8.350	8.356	8.362	8.369	8.375	8.381	2,450
2,460	8.381	8.387	8.393	8.399	8.405	8.412	8.418	8.424	8.430	8.436	8.442	2,460
2,470	8.442	8.449	8.455	8.461	8.467	8.473	8.479	8.486	8.492	8.498	8.504	2,470
2,480	8.504	8.510	8.516	8.523	8.529	8.535	8.541	8.547	8.554	8.560	8.566	2,480
2,490	8.566	8.572	8.578	8.585	8.591	8.597	8.603	8.609	8.616	8.622	8.628	2,490
2,500	8.628	8.634	8.640	8.647	8.653	8.659	8.665	8.671	8.678	8.684	8.690	2,500
2,510	8.690	8.696	8.702	8.709	8.715	8.721	8.727	8.733	8.740	8.746	8.752	2,510
2,520	8.752	8.758	8.765	8.771	8.777	8.783	8.790	8.796	8.802	8.808	8.814	2,520
2,530	8.814	8.821	8.827	8.833	8.839	8.846	8.852	8.858	8.864	8.871	8.877	2,530
2,540	8.877	8.883	8.889	8.896	8.902	8.908	8.914	8.921	8.927	8.933	8.939	2,540
2,550	8.939	8.946	8.952	8.958	8.964	8.971	8.977	8.983	8.989	8.996	9.002	2,550
2,560	9.002	9.008	9.015	9.021	9.027	9.033	9.040	9.046	9.052	9.058	9.064	2,560
2,570	9.065	9.071	9.077	9.084	9.090	9.096	9.102	9.109	9.115	9.121	9.128	2,570
2,580	9.128	9.134	9.140	9.146	9.153	9.159	9.165	9.172	9.178	9.184	9.191	2,580
2,590	9.191	9.197	9.203	9.209	9.216	9.222	9.228	9.235	9.241	9.247	9.254	2,590
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F

* Converted from degrees Celsius (IPTS 1968).

TABLE 3 Type B Thermocouples Continued
Temperature in Degrees Fahrenheit*

EMF in Absolute Millivolts		Reference Junctions at 32 F										
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
2,600	9.254	9.260	9.266	9.273	9.279	9.285	9.291	9.298	9.304	9.310	9.317	2,600
2,610	9.317	9.323	9.329	9.336	9.342	9.348	9.355	9.361	9.367	9.374	9.380	2,610
2,620	9.380	9.386	9.393	9.399	9.405	9.412	9.418	9.424	9.431	9.437	9.443	2,620
2,630	9.443	9.450	9.456	9.462	9.469	9.475	9.481	9.488	9.494	9.500	9.507	2,630
2,640	9.507	9.513	9.519	9.526	9.532	9.538	9.545	9.551	9.558	9.564	9.570	2,640
2,650	9.570	9.577	9.583	9.589	9.596	9.602	9.608	9.615	9.621	9.627	9.634	2,650
2,660	9.634	9.640	9.647	9.653	9.659	9.666	9.672	9.678	9.685	9.691	9.697	2,660
2,670	9.697	9.704	9.710	9.717	9.723	9.729	9.736	9.742	9.748	9.755	9.761	2,670
2,680	9.761	9.768	9.774	9.780	9.787	9.793	9.800	9.806	9.812	9.819	9.825	2,680
2,690	9.825	9.831	9.838	9.844	9.851	9.857	9.863	9.870	9.876	9.883	9.889	2,690
2,700	9.889	9.895	9.902	9.908	9.915	9.921	9.927	9.934	9.940	9.947	9.953	2,700
2,710	9.953	9.959	9.966	9.972	9.979	9.985	9.991	9.998	10.004	10.011	10.017	2,710
2,720	10.017	10.023	10.030	10.036	10.043	10.049	10.056	10.062	10.068	10.075	10.081	2,720
2,730	10.081	10.088	10.094	10.100	10.107	10.113	10.120	10.126	10.133	10.139	10.145	2,730
2,740	10.145	10.152	10.158	10.165	10.171	10.178	10.184	10.190	10.197	10.203	10.210	2,740
2,750	10.210	10.216	10.223	10.229	10.235	10.242	10.248	10.255	10.261	10.268	10.274	2,750
2,760	10.274	10.280	10.287	10.293	10.300	10.306	10.313	10.319	10.325	10.332	10.338	2,760
2,770	10.338	10.345	10.351	10.358	10.364	10.371	10.377	10.383	10.390	10.396	10.403	2,770
2,780	10.403	10.409	10.416	10.422	10.429	10.435	10.441	10.448	10.454	10.461	10.467	2,780
2,790	10.467	10.474	10.480	10.487	10.493	10.500	10.506	10.512	10.519	10.525	10.532	2,790
2,800	10.532	10.538	10.545	10.551	10.558	10.564	10.571	10.577	10.584	10.590	10.596	2,800
2,810	10.596	10.603	10.609	10.616	10.622	10.629	10.635	10.642	10.648	10.655	10.661	2,810
2,820	10.661	10.668	10.674	10.680	10.687	10.693	10.700	10.706	10.713	10.719	10.726	2,820
2,830	10.726	10.732	10.739	10.745	10.752	10.758	10.765	10.771	10.778	10.784	10.790	2,830
2,840	10.790	10.797	10.803	10.810	10.816	10.823	10.829	10.836	10.842	10.849	10.855	2,840
2,850	10.855	10.862	10.868	10.875	10.881	10.888	10.894	10.901	10.907	10.914	10.920	2,850
2,860	10.920	10.926	10.933	10.939	10.946	10.952	10.959	10.965	10.972	10.978	10.985	2,860
2,870	10.985	10.991	10.998	11.004	11.011	11.017	11.024	11.030	11.037	11.043	11.050	2,870
2,880	11.050	11.056	11.063	11.069	11.076	11.082	11.089	11.095	11.102	11.108	11.115	2,880
2,890	11.115	11.121	11.128	11.134	11.141	11.147	11.154	11.160	11.166	11.173	11.179	2,890
2,900	11.179	11.186	11.192	11.199	11.205	11.212	11.218	11.225	11.231	11.238	11.244	2,900
2,910	11.244	11.251	11.257	11.264	11.270	11.277	11.283	11.290	11.296	11.303	11.309	2,910
2,920	11.309	11.316	11.322	11.329	11.335	11.342	11.348	11.355	11.361	11.368	11.374	2,920
2,930	11.374	11.381	11.387	11.394	11.400	11.407	11.413	11.420	11.426	11.433	11.439	2,930
2,940	11.439	11.446	11.452	11.459	11.465	11.472	11.478	11.485	11.491	11.498	11.504	2,940
2,950	11.504	11.511	11.517	11.524	11.530	11.537	11.543	11.550	11.556	11.563	11.569	2,950
2,960	11.569	11.576	11.582	11.589	11.595	11.602	11.608	11.615	11.621	11.628	11.634	2,960
2,970	11.634	11.641	11.647	11.654	11.660	11.667	11.673	11.680	11.686	11.693	11.699	2,970
2,980	11.699	11.706	11.712	11.719	11.725	11.732	11.738	11.745	11.751	11.758	11.764	2,980
2,990	11.764	11.771	11.777	11.784	11.790	11.797	11.803	11.810	11.816	11.823	11.829	2,990
3,000	11.829	11.836	11.842	11.849	11.855	11.862	11.868	11.875	11.881	11.888	11.894	3,000
3,010	11.894	11.901	11.907	11.914	11.920	11.927	11.933	11.940	11.946	11.953	11.959	3,010
3,020	11.959	11.966	11.972	11.979	11.985	11.992	11.998	12.005	12.011	12.018	12.024	3,020
3,030	12.024	12.031	12.037	12.044	12.050	12.057	12.063	12.070	12.076	12.083	12.089	3,030
3,040	12.089	12.096	12.102	12.109	12.115	12.121	12.128	12.134	12.141	12.147	12.154	3,040
3,050	12.154	12.160	12.167	12.173	12.180	12.186	12.193	12.199	12.206	12.212	12.219	3,050
3,060	12.219	12.225	12.232	12.238	12.245	12.251	12.258	12.264	12.271	12.277	12.284	3,060
3,070	12.284	12.290	12.297	12.303	12.310	12.316	12.322	12.329	12.336	12.342	12.349	3,070
3,080	12.349	12.355	12.362	12.368	12.374	12.381	12.387	12.394	12.400	12.407	12.413	3,080
3,090	12.413	12.420	12.426	12.433	12.439	12.446	12.452	12.459	12.465	12.472	12.478	3,090
3,100	12.478	12.485	12.491	12.498	12.504	12.511	12.517	12.523	12.530	12.536	12.543	3,100
3,110	12.543	12.549	12.556	12.562	12.569	12.575	12.582	12.588	12.595	12.601	12.608	3,110
3,120	12.608	12.614	12.621	12.627	12.633	12.640	12.646	12.653	12.659	12.666	12.672	3,120
3,130	12.672	12.679	12.685	12.692	12.698	12.705	12.711	12.718	12.724	12.730	12.737	3,130
3,140	12.737	12.743	12.750	12.756	12.763	12.769	12.775	12.782	12.789	12.795	12.801	3,140
3,150	12.801	12.808	12.814	12.821	12.827	12.834	12.840	12.847	12.853	12.860	12.866	3,150
3,160	12.866	12.872	12.879	12.885	12.892	12.898	12.905	12.911	12.918	12.924	12.930	3,160
3,170	12.930	12.937	12.943	12.950	12.956	12.963	12.969	12.976	12.982	12.988	12.995	3,170
3,180	12.995	13.001	13.008	13.014	13.021	13.027	13.034	13.040	13.046	13.053	13.059	3,180
3,190	13.059	13.066	13.072	13.079	13.085	13.091	13.098	13.104	13.111	13.117	13.124	3,190
3,200	13.124	13.130	13.136	13.143	13.149	13.156	13.162	13.169	13.175	13.181	13.188	3,200
3,210	13.188	13.194	13.201	13.207	13.213	13.220	13.226	13.233	13.239	13.246	13.252	3,210
3,220	13.252	13.258	13.265	13.271	13.278	13.284	13.290	13.297	13.303	13.310	13.316	3,220
3,230	13.316	13.322	13.329	13.335	13.342	13.348	13.354	13.361	13.367	13.374	13.380	3,230
3,240	13.380	13.387	13.393	13.399	13.406	13.412	13.418	13.425	13.431	13.438	13.444	3,240

DEG F 0 1 2 3 4 5 6 7 8 9 10 DEG F

* Converted from degrees Celsius (IPTS 1968).

TABLE 3 Type B Thermocouples Continued
Temperature in Degrees Fahrenheit^a

EMF in Absolute Millivolts

Reference Junctions at 32 F

DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
3,250	13.444	13.450	13.457	13.463	13.470	13.476	13.482	13.489	13.495	13.502	13.508	3,250
3,260	13.508	13.514	13.521	13.527	13.533	13.540	13.546	13.553	13.559	13.565	13.572	3,260
3,270	13.572	13.578	13.585	13.591	13.597	13.604	13.610	13.616	13.623	13.629	13.635	3,270
3,280	13.635	13.642	13.648	13.655	13.661	13.667	13.674	13.680	13.686	13.693	13.699	3,280
3,290	13.699	13.706	13.712	13.718	13.725	13.731	13.737	13.744	13.750	13.756	13.763	3,290
3,300	13.763	13.769	13.775	13.782	13.788	13.794	13.801	13.807	13.814			3,300
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F

^a Converted from degrees Celsius (IPTS 1968).

TABLE 4 Type B Thermocouples
Temperature in Degrees Celsius (IPTS 1968)

EMF in Absolute Millivolts

Reference Junctions at 0 C

DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
0	0.000	-0.000	-0.000	-0.001	-0.001	-0.001	-0.001	-0.001	-0.002	-0.002	-0.002	0
10	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.003	-0.003	-0.003	10
20	-0.003	-0.003	-0.003	-0.003	-0.003	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	20
30	-0.002	-0.002	-0.002	-0.002	-0.002	-0.001	-0.001	-0.001	-0.001	-0.001	-0.000	30
40	-0.000	-0.000	-0.000	0.000	0.000	0.001	0.001	0.001	0.002	0.002	0.002	40
50	0.002	0.003	0.003	0.003	0.004	0.004	0.004	0.005	0.005	0.006	0.006	50
60	0.006	0.007	0.007	0.008	0.008	0.009	0.009	0.010	0.010	0.011	0.011	60
70	0.011	0.012	0.012	0.013	0.014	0.014	0.015	0.015	0.016	0.017	0.017	70
80	0.017	0.018	0.019	0.020	0.020	0.021	0.022	0.022	0.023	0.024	0.025	80
90	0.025	0.026	0.026	0.027	0.028	0.029	0.030	0.031	0.031	0.032	0.033	90
100	0.033	0.034	0.035	0.036	0.037	0.038	0.039	0.040	0.041	0.042	0.043	100
110	0.043	0.044	0.045	0.046	0.047	0.048	0.049	0.050	0.051	0.052	0.053	110
120	0.053	0.055	0.056	0.057	0.058	0.059	0.060	0.062	0.063	0.064	0.065	120
130	0.065	0.066	0.068	0.069	0.070	0.071	0.073	0.074	0.075	0.077	0.078	130
140	0.078	0.079	0.081	0.082	0.083	0.085	0.086	0.088	0.089	0.091	0.092	140
150	0.092	0.093	0.095	0.096	0.098	0.099	0.101	0.102	0.104	0.106	0.107	150
160	0.107	0.109	0.110	0.112	0.113	0.115	0.117	0.118	0.120	0.122	0.123	160
170	0.123	0.125	0.127	0.128	0.130	0.132	0.133	0.135	0.137	0.139	0.140	170
180	0.140	0.142	0.144	0.146	0.148	0.149	0.151	0.153	0.155	0.157	0.159	180
190	0.159	0.161	0.163	0.164	0.166	0.168	0.170	0.172	0.174	0.176	0.178	190
200	0.178	0.180	0.182	0.184	0.186	0.188	0.190	0.192	0.194	0.197	0.199	200
210	0.199	0.201	0.203	0.205	0.207	0.209	0.211	0.214	0.216	0.218	0.220	210
220	0.220	0.232	0.225	0.227	0.229	0.231	0.234	0.236	0.238	0.240	0.243	220
230	0.243	0.245	0.247	0.250	0.252	0.254	0.257	0.259	0.262	0.264	0.266	230
240	0.266	0.269	0.271	0.274	0.276	0.279	0.281	0.284	0.286	0.289	0.291	240
250	0.291	0.294	0.296	0.299	0.301	0.304	0.307	0.309	0.312	0.314	0.317	250
260	0.317	0.320	0.322	0.325	0.328	0.330	0.333	0.336	0.338	0.341	0.344	260
270	0.317	0.320	0.322	0.325	0.328	0.330	0.333	0.336	0.338	0.341	0.344	270
280	0.344	0.347	0.349	0.352	0.355	0.358	0.360	0.363	0.366	0.369	0.372	280
290	0.372	0.375	0.377	0.380	0.383	0.386	0.389	0.392	0.395	0.398	0.401	290
300	0.401	0.404	0.406	0.409	0.412	0.415	0.418	0.421	0.424	0.427	0.431	300
310	0.431	0.434	0.437	0.440	0.443	0.446	0.449	0.452	0.455	0.458	0.462	310
320	0.462	0.465	0.468	0.471	0.474	0.477	0.481	0.484	0.487	0.490	0.494	320
330	0.494	0.497	0.500	0.503	0.507	0.510	0.513	0.517	0.520	0.523	0.527	330
340	0.527	0.530	0.533	0.537	0.540	0.544	0.547	0.550	0.554	0.557	0.561	340
350	0.561	0.564	0.568	0.571	0.575	0.578	0.582	0.585	0.589	0.592	0.596	350
360	0.596	0.599	0.603	0.606	0.610	0.614	0.617	0.621	0.625	0.628	0.632	360
370	0.632	0.636	0.639	0.643	0.647	0.650	0.654	0.658	0.661	0.665	0.669	370
380	0.669	0.673	0.677	0.680	0.684	0.688	0.692	0.696	0.699	0.703	0.707	380
390	0.707	0.711	0.715	0.719	0.723	0.727	0.730	0.734	0.738	0.742	0.746	390
400	0.746	0.750	0.754	0.758	0.762	0.766	0.770	0.774	0.778	0.782	0.786	400
410	0.786	0.790	0.794	0.799	0.803	0.807	0.811	0.815	0.819	0.823	0.827	410
420	0.827	0.832	0.836	0.840	0.844	0.848	0.853	0.857	0.861	0.865	0.870	420
430	0.870	0.874	0.878	0.882	0.887	0.891	0.895	0.900	0.904	0.908	0.913	430
440	0.913	0.917	0.921	0.926	0.930	0.935	0.939	0.943	0.948	0.952	0.957	440
450	0.957	0.961	0.966	0.970	0.975	0.979	0.984	0.988	0.993	0.997	1.002	450
460	1.002	1.006	1.011	1.015	1.020	1.025	1.029	1.034	1.039	1.043	1.048	460
470	1.048	1.052	1.057	1.062	1.066	1.071	1.076	1.081	1.085	1.090	1.095	470
480	1.095	1.100	1.104	1.109	1.114	1.119	1.123	1.128	1.133	1.138	1.143	480
490	1.143	1.148	1.152	1.157	1.162	1.167	1.172	1.177	1.182	1.187	1.192	490
500	1.192	1.197	1.202	1.206	1.211	1.216	1.221	1.226	1.231	1.236	1.241	500
510	1.241	1.246	1.252	1.257	1.262	1.267	1.272	1.277	1.282	1.287	1.292	510
520	1.292	1.297	1.303	1.308	1.313	1.318	1.323	1.328	1.334	1.339	1.344	520
530	1.344	1.349	1.354	1.360	1.365	1.370	1.375	1.381	1.386	1.391	1.397	530
540	1.397	1.402	1.407	1.413	1.418	1.423	1.429	1.434	1.439	1.445	1.450	540
550	1.450	1.456	1.461	1.467	1.472	1.477	1.483	1.488	1.494	1.499	1.505	550
560	1.505	1.510	1.516	1.521	1.527	1.532	1.538	1.544	1.549	1.555	1.560	560
570	1.560	1.566	1.571	1.577	1.583	1.588	1.594	1.600	1.605	1.611	1.617	570
580	1.617	1.622	1.628	1.634	1.639	1.645	1.651	1.657	1.662	1.668	1.674	580
590	1.674	1.680	1.685	1.691	1.697	1.703	1.709	1.715	1.720	1.726	1.732	590
600	1.732	1.738	1.744	1.750	1.756	1.762	1.767	1.773	1.779	1.785	1.791	600
610	1.791	1.797	1.803	1.809	1.815	1.821	1.827	1.833	1.839	1.845	1.851	610
620	1.851	1.857	1.863	1.869	1.875	1.882	1.888	1.894	1.900	1.906	1.912	620
630	1.912	1.918	1.924	1.931	1.937	1.943	1.949	1.955	1.961	1.968	1.974	630
640	1.974	1.980	1.986	1.993	1.999	2.005	2.011	2.018	2.024	2.030	2.036	640
650	2.036	2.043	2.049	2.055	2.062	2.068	2.074	2.081	2.087	2.094	2.100	650
DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C

TABLE 4 Type B Thermocouples Continued
Temperature in Degrees Celsius (IPTS 1968)

EMF in Absolute Millivolts

Reference Junctions at 0 C

DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
650	2.100	2.106	2.113	2.119	2.126	2.132	2.139	2.145	2.151	2.158	2.164	650
660	2.164	2.171	2.177	2.184	2.190	2.197	2.203	2.210	2.216	2.223	2.230	660
670	2.230	2.236	2.243	2.249	2.256	2.263	2.269	2.276	2.282	2.289	2.296	670
680	2.296	2.302	2.309	2.316	2.322	2.329	2.336	2.343	2.349	2.356	2.363	680
690	2.363	2.369	2.376	2.383	2.390	2.396	2.403	2.410	2.417	2.424	2.430	690
700	2.430	2.437	2.444	2.451	2.458	2.465	2.472	2.478	2.485	2.492	2.499	700
710	2.499	2.506	2.513	2.520	2.527	2.534	2.541	2.548	2.555	2.562	2.569	710
720	2.569	2.576	2.583	2.590	2.597	2.604	2.611	2.618	2.625	2.632	2.639	720
730	2.639	2.646	2.653	2.660	2.667	2.674	2.682	2.689	2.696	2.703	2.710	730
740	2.710	2.717	2.724	2.732	2.739	2.746	2.753	2.760	2.768	2.775	2.782	740
750	2.782	2.789	2.797	2.804	2.811	2.818	2.826	2.833	2.840	2.848	2.855	750
760	2.855	2.862	2.869	2.877	2.884	2.892	2.900	2.906	2.914	2.921	2.928	760
770	2.928	2.936	2.943	2.951	2.958	2.966	2.973	2.980	2.988	2.995	3.003	770
780	3.003	3.010	3.018	3.025	3.033	3.040	3.048	3.055	3.063	3.070	3.078	780
790	3.073	3.080	3.087	3.101	3.108	3.116	3.124	3.131	3.139	3.146	3.154	790
800	3.154	3.162	3.169	3.177	3.185	3.192	3.200	3.208	3.215	3.223	3.231	800
810	3.231	3.239	3.246	3.254	3.262	3.269	3.277	3.285	3.293	3.301	3.308	810
820	3.308	3.316	3.324	3.332	3.340	3.347	3.355	3.363	3.371	3.379	3.387	820
830	3.387	3.395	3.402	3.410	3.418	3.426	3.434	3.442	3.450	3.458	3.466	830
840	3.466	3.474	3.482	3.490	3.498	3.506	3.514	3.522	3.530	3.538	3.546	840
850	3.546	3.554	3.562	3.570	3.578	3.586	3.594	3.602	3.610	3.618	3.626	850
860	3.626	3.634	3.643	3.651	3.659	3.667	3.675	3.683	3.691	3.700	3.708	860
870	3.708	3.716	3.724	3.732	3.741	3.749	3.757	3.765	3.773	3.782	3.790	870
880	3.790	3.798	3.806	3.815	3.823	3.831	3.840	3.848	3.856	3.865	3.873	880
890	3.873	3.881	3.890	3.898	3.906	3.915	3.923	3.931	3.940	3.948	3.957	890
900	3.957	3.965	3.973	3.982	3.990	3.999	4.007	4.016	4.024	4.032	4.041	900
910	4.041	4.049	4.058	4.066	4.075	4.083	4.092	4.100	4.109	4.117	4.126	910
920	4.126	4.135	4.143	4.152	4.160	4.169	4.177	4.186	4.195	4.203	4.212	920
930	4.212	4.220	4.229	4.238	4.246	4.255	4.264	4.272	4.281	4.290	4.298	930
940	4.298	4.307	4.316	4.325	4.334	4.342	4.351	4.359	4.368	4.377	4.386	940
950	4.386	4.394	4.403	4.412	4.421	4.430	4.438	4.447	4.456	4.465	4.474	950
960	4.474	4.483	4.491	4.500	4.509	4.518	4.527	4.536	4.545	4.553	4.562	960
970	4.562	4.571	4.580	4.589	4.598	4.607	4.616	4.625	4.634	4.643	4.652	970
980	4.652	4.661	4.670	4.679	4.688	4.697	4.706	4.715	4.724	4.733	4.742	980
990	4.742	4.751	4.760	4.769	4.778	4.787	4.796	4.805	4.814	4.824	4.833	990
1.000	4.833	4.842	4.851	4.860	4.869	4.878	4.887	4.897	4.906	4.915	4.924	1.000
1.010	4.924	4.933	4.942	4.952	4.961	4.970	4.979	4.989	4.998	5.007	5.016	1.010
1.020	5.016	5.025	5.035	5.044	5.053	5.063	5.072	5.081	5.090	5.100	5.109	1.020
1.030	5.109	5.118	5.128	5.137	5.146	5.156	5.165	5.174	5.184	5.193	5.202	1.030
1.040	5.202	5.212	5.221	5.231	5.240	5.249	5.259	5.268	5.278	5.287	5.297	1.040
1.050	5.297	5.306	5.316	5.325	5.334	5.344	5.353	5.363	5.372	5.382	5.391	1.050
1.060	5.391	5.401	5.410	5.420	5.429	5.439	5.449	5.458	5.468	5.477	5.487	1.060
1.070	5.487	5.496	5.506	5.516	5.525	5.535	5.544	5.554	5.564	5.573	5.583	1.070
1.080	5.583	5.593	5.602	5.612	5.621	5.631	5.641	5.651	5.660	5.670	5.680	1.080
1.090	5.680	5.689	5.699	5.709	5.718	5.728	5.738	5.748	5.757	5.767	5.777	1.090
1.100	5.777	5.787	5.796	5.806	5.816	5.826	5.836	5.845	5.855	5.865	5.875	1.100
1.110	5.875	5.885	5.895	5.904	5.914	5.924	5.934	5.944	5.954	5.964	5.973	1.110
1.120	5.973	5.983	5.993	6.003	6.013	6.023	6.033	6.043	6.053	6.063	6.073	1.120
1.130	6.073	6.083	6.093	6.102	6.112	6.122	6.132	6.142	6.152	6.162	6.172	1.130
1.140	6.172	6.182	6.192	6.202	6.212	6.223	6.233	6.243	6.253	6.263	6.273	1.140
1.150	6.273	6.283	6.293	6.303	6.313	6.323	6.333	6.343	6.353	6.364	6.374	1.150
1.160	6.374	6.384	6.394	6.404	6.414	6.424	6.435	6.445	6.455	6.465	6.475	1.160
1.170	6.475	6.485	6.496	6.506	6.516	6.526	6.536	6.547	6.557	6.567	6.577	1.170
1.180	6.577	6.588	6.598	6.608	6.618	6.629	6.639	6.649	6.659	6.670	6.680	1.180
1.190	6.680	6.690	6.701	6.711	6.721	6.732	6.742	6.752	6.763	6.773	6.783	1.190
1.200	6.783	6.794	6.804	6.814	6.825	6.835	6.846	6.856	6.866	6.877	6.887	1.200
1.210	6.887	6.898	6.908	6.918	6.929	6.939	6.950	6.960	6.971	6.981	6.991	1.210
1.220	6.991	7.002	7.012	7.023	7.033	7.044	7.054	7.065	7.075	7.086	7.096	1.220
1.230	7.096	7.107	7.117	7.128	7.138	7.149	7.159	7.170	7.181	7.191	7.202	1.230
1.240	7.202	7.212	7.223	7.233	7.244	7.255	7.265	7.276	7.286	7.297	7.308	1.240
1.250	7.308	7.318	7.329	7.339	7.350	7.361	7.371	7.382	7.393	7.403	7.414	1.250
1.260	7.414	7.425	7.435	7.446	7.457	7.467	7.478	7.489	7.500	7.510	7.521	1.260
1.270	7.521	7.532	7.542	7.553	7.564	7.575	7.585	7.596	7.607	7.618	7.628	1.270
1.280	7.628	7.639	7.650	7.661	7.671	7.682	7.693	7.704	7.715	7.725	7.736	1.280
1.290	7.736	7.747	7.758	7.769	7.780	7.790	7.801	7.812	7.823	7.834	7.845	1.290
DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C

TABLE 4 Type B Thermocouples Continued
Temperature in Degrees Celsius (IPTS 1968)

EMF in Absolute Millivolts

Reference Junctions at 0 C

DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
1.300	7.845	7.855	7.866	7.877	7.888	7.899	7.910	7.921	7.932	7.943	7.953	1.300
1.310	7.953	7.964	7.975	7.986	7.997	8.008	8.019	8.030	8.041	8.052	8.063	1.310
1.320	8.063	8.074	8.085	8.096	8.107	8.118	8.128	8.139	8.150	8.161	8.172	1.320
1.330	8.172	8.183	8.194	8.205	8.216	8.227	8.238	8.249	8.261	8.272	8.283	1.330
1.340	8.283	8.294	8.305	8.316	8.327	8.338	8.349	8.360	8.371	8.382	8.393	1.340
1.350	8.393	8.404	8.415	8.426	8.437	8.449	8.460	8.471	8.482	8.493	8.504	1.350
1.360	8.504	8.515	8.526	8.538	8.549	8.560	8.571	8.582	8.593	8.604	8.616	1.360
1.370	8.616	8.627	8.638	8.649	8.660	8.671	8.683	8.694	8.705	8.716	8.727	1.370
1.380	8.727	8.738	8.750	8.761	8.772	8.783	8.795	8.806	8.817	8.828	8.839	1.380
1.390	8.839	8.851	8.862	8.873	8.884	8.896	8.907	8.918	8.929	8.941	8.952	1.390
1.400	8.952	8.963	8.974	8.986	8.997	9.008	9.020	9.031	9.042	9.053	9.065	1.400
1.410	9.065	9.076	9.087	9.099	9.110	9.121	9.133	9.144	9.155	9.167	9.178	1.410
1.420	9.178	9.189	9.201	9.212	9.223	9.235	9.246	9.257	9.269	9.280	9.291	1.420
1.430	9.291	9.303	9.314	9.326	9.337	9.348	9.360	9.371	9.382	9.394	9.405	1.430
1.440	9.405	9.417	9.428	9.439	9.451	9.462	9.474	9.485	9.497	9.508	9.519	1.440
1.450	9.519	9.531	9.542	9.554	9.565	9.577	9.588	9.599	9.611	9.622	9.634	1.450
1.460	9.634	9.645	9.657	9.668	9.680	9.691	9.703	9.714	9.726	9.737	9.748	1.460
1.470	9.748	9.760	9.771	9.783	9.794	9.806	9.817	9.829	9.840	9.852	9.863	1.470
1.480	9.863	9.875	9.886	9.898	9.909	9.921	9.933	9.944	9.956	9.967	9.979	1.480
1.490	9.979	9.990	10.002	10.013	10.025	10.036	10.048	10.059	10.071	10.082	10.094	1.490
1.500	10.094	10.106	10.117	10.129	10.140	10.152	10.163	10.175	10.187	10.198	10.210	1.500
1.510	10.210	10.221	10.233	10.244	10.256	10.268	10.279	10.291	10.302	10.314	10.325	1.510
1.520	10.325	10.337	10.349	10.360	10.372	10.383	10.395	10.407	10.418	10.430	10.441	1.520
1.530	10.441	10.453	10.465	10.476	10.488	10.500	10.511	10.523	10.534	10.546	10.558	1.530
1.540	10.558	10.569	10.581	10.593	10.604	10.616	10.627	10.639	10.651	10.662	10.674	1.540
1.550	10.674	10.686	10.697	10.709	10.721	10.732	10.744	10.756	10.767	10.779	10.790	1.550
1.560	10.790	10.802	10.814	10.825	10.837	10.849	10.860	10.872	10.884	10.895	10.907	1.560
1.570	10.907	10.919	10.930	10.942	10.954	10.965	10.977	10.989	11.000	11.012	11.024	1.570
1.580	11.024	11.035	11.047	11.059	11.070	11.082	11.094	11.105	11.117	11.129	11.141	1.580
1.590	11.141	11.152	11.164	11.176	11.187	11.199	11.211	11.222	11.234	11.246	11.257	1.590
1.600	11.257	11.269	11.281	11.292	11.304	11.316	11.328	11.339	11.351	11.363	11.374	1.600
1.610	11.374	11.386	11.398	11.409	11.421	11.433	11.444	11.456	11.468	11.480	11.491	1.610
1.620	11.491	11.503	11.515	11.526	11.538	11.550	11.561	11.573	11.585	11.597	11.608	1.620
1.630	11.608	11.620	11.632	11.643	11.655	11.667	11.678	11.690	11.702	11.714	11.725	1.630
1.640	11.725	11.737	11.749	11.760	11.772	11.784	11.795	11.807	11.819	11.830	11.842	1.640
1.650	11.842	11.854	11.866	11.877	11.889	11.901	11.912	11.924	11.936	11.947	11.959	1.650
1.660	11.959	11.971	11.983	11.994	12.006	12.018	12.029	12.041	12.053	12.064	12.076	1.660
1.670	12.076	12.088	12.099	12.111	12.123	12.134	12.146	12.158	12.170	12.181	12.193	1.670
1.680	12.193	12.205	12.216	12.228	12.240	12.251	12.263	12.275	12.286	12.298	12.310	1.680
1.690	12.310	12.321	12.333	12.345	12.356	12.368	12.380	12.391	12.403	12.415	12.426	1.690
1.700	12.426	12.438	12.450	12.461	12.473	12.485	12.496	12.508	12.520	12.531	12.543	1.700
1.710	12.543	12.555	12.566	12.578	12.590	12.601	12.613	12.624	12.636	12.648	12.659	1.710
1.720	12.659	12.671	12.683	12.694	12.706	12.718	12.729	12.741	12.752	12.764	12.776	1.720
1.730	12.776	12.787	12.799	12.811	12.822	12.834	12.845	12.857	12.869	12.880	12.892	1.730
1.740	12.892	12.903	12.915	12.927	12.938	12.950	12.961	12.973	12.985	12.996	13.008	1.740
1.750	13.008	13.019	13.031	13.043	13.054	13.066	13.077	13.089	13.100	13.112	13.124	1.750
1.760	13.124	13.135	13.147	13.158	13.170	13.181	13.193	13.204	13.216	13.228	13.239	1.760
1.770	13.239	13.251	13.262	13.274	13.285	13.297	13.308	13.320	13.331	13.343	13.354	1.770
1.780	13.354	13.366	13.378	13.389	13.401	13.412	13.424	13.435	13.447	13.458	13.470	1.780
1.790	13.470	13.481	13.493	13.504	13.516	13.527	13.539	13.550	13.562	13.573	13.585	1.790
1.800	13.585	13.596	13.607	13.619	13.630	13.642	13.653	13.665	13.676	13.688	13.699	1.800
1.810	13.699	13.711	13.722	13.733	13.745	13.756	13.768	13.779	13.791	13.802	13.814	1.810
1.820	13.814											1.820
DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C

TABLE 5 Type E Thermocouples
Temperature in Degrees Fahrenheit*

EMF in Absolute Millivolts

Reference Junctions at 32 F

DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
-450	-9.830	-9.832	-9.833	-9.834	-9.835							-450
-440	-9.809	-9.812	-9.814	-9.817	-9.819	-9.821	-9.823	-9.825	-9.827	-9.829	-9.830	-440
-430	-9.775	-9.779	-9.783	-9.786	-9.790	-9.793	-9.797	-9.800	-9.803	-9.806	-9.809	-430
-420	-9.729	-9.734	-9.739	-9.744	-9.749	-9.753	-9.758	-9.762	-9.767	-9.771	-9.775	-420
-410	-9.672	-9.678	-9.684	-9.690	-9.696	-9.702	-9.708	-9.713	-9.719	-9.724	-9.729	-410
-400	-9.604	-9.611	-9.619	-9.626	-9.633	-9.639	-9.646	-9.653	-9.659	-9.666	-9.672	-400
-390	-9.526	-9.534	-9.542	-9.550	-9.558	-9.566	-9.574	-9.582	-9.589	-9.597	-9.604	-390
-380	-9.437	-9.446	-9.455	-9.464	-9.473	-9.482	-9.491	-9.500	-9.509	-9.517	-9.526	-380
-370	-9.338	-9.348	-9.358	-9.368	-9.378	-9.388	-9.398	-9.408	-9.418	-9.427	-9.437	-370
-360	-9.229	-9.241	-9.252	-9.263	-9.274	-9.285	-9.296	-9.306	-9.317	-9.327	-9.338	-360
-350	-9.112	-9.124	-9.136	-9.148	-9.160	-9.172	-9.184	-9.195	-9.207	-9.218	-9.229	-350
-340	-8.986	-8.999	-9.012	-9.025	-9.038	-9.050	-9.063	-9.075	-9.088	-9.100	-9.112	-340
-330	-8.852	-8.866	-8.880	-8.893	-8.907	-8.920	-8.934	-8.947	-8.960	-8.973	-8.986	-330
-320	-8.710	-8.725	-8.739	-8.754	-8.768	-8.782	-8.796	-8.810	-8.824	-8.838	-8.852	-320
-310	-8.561	-8.576	-8.591	-8.606	-8.621	-8.636	-8.651	-8.666	-8.681	-8.696	-8.710	-310
-300	-8.404	-8.420	-8.436	-8.452	-8.468	-8.483	-8.499	-8.514	-8.530	-8.545	-8.561	-300
-290	-8.240	-8.257	-8.273	-8.290	-8.306	-8.323	-8.339	-8.355	-8.372	-8.388	-8.404	-290
-280	-8.069	-8.086	-8.104	-8.121	-8.138	-8.155	-8.172	-8.189	-8.206	-8.223	-8.240	-280
-270	-7.891	-7.909	-7.927	-7.945	-7.963	-7.981	-7.999	-8.016	-8.034	-8.051	-8.069	-270
-260	-7.707	-7.726	-7.744	-7.763	-7.781	-7.800	-7.818	-7.837	-7.855	-7.873	-7.891	-260
-250	-7.516	-7.535	-7.555	-7.574	-7.593	-7.612	-7.631	-7.650	-7.669	-7.688	-7.707	-250
-240	-7.319	-7.339	-7.359	-7.379	-7.399	-7.418	-7.438	-7.458	-7.477	-7.497	-7.516	-240
-230	-7.116	-7.137	-7.157	-7.178	-7.198	-7.218	-7.239	-7.259	-7.279	-7.299	-7.319	-230
-220	-6.907	-6.928	-6.949	-6.970	-6.991	-7.012	-7.033	-7.054	-7.075	-7.095	-7.116	-220
-210	-6.692	-6.714	-6.735	-6.757	-6.779	-6.800	-6.822	-6.843	-6.864	-6.886	-6.907	-210
-200	-6.471	-6.494	-6.516	-6.538	-6.560	-6.582	-6.604	-6.626	-6.648	-6.670	-6.692	-200
-190	-6.245	-6.268	-6.291	-6.314	-6.336	-6.359	-6.382	-6.404	-6.427	-6.449	-6.471	-190
-180	-6.013	-6.037	-6.060	-6.084	-6.107	-6.130	-6.153	-6.176	-6.199	-6.222	-6.245	-180
-170	-5.776	-5.800	-5.824	-5.848	-5.872	-5.896	-5.919	-5.943	-5.967	-5.990	-6.013	-170
-160	-5.534	-5.559	-5.583	-5.607	-5.632	-5.656	-5.680	-5.704	-5.728	-5.752	-5.776	-160
-150	-5.287	-5.312	-5.337	-5.362	-5.386	-5.411	-5.436	-5.460	-5.485	-5.510	-5.534	-150
-140	-5.034	-5.060	-5.085	-5.111	-5.136	-5.161	-5.186	-5.212	-5.237	-5.262	-5.287	-140
-130	-4.777	-4.803	-4.829	-4.855	-4.880	-4.906	-4.932	-4.958	-4.983	-5.009	-5.034	-130
-120	-4.515	-4.541	-4.567	-4.594	-4.620	-4.646	-4.672	-4.699	-4.725	-4.751	-4.777	-120
-110	-4.248	-4.274	-4.301	-4.328	-4.355	-4.382	-4.408	-4.435	-4.462	-4.488	-4.515	-110
-100	-3.976	-4.003	-4.031	-4.058	-4.085	-4.112	-4.139	-4.167	-4.194	-4.221	-4.248	-100
-90	-3.700	-3.728	-3.755	-3.783	-3.811	-3.838	-3.866	-3.894	-3.921	-3.949	-3.976	-90
-80	-3.419	-3.447	-3.475	-3.504	-3.532	-3.560	-3.588	-3.616	-3.644	-3.672	-3.700	-80
-70	-3.134	-3.163	-3.192	-3.220	-3.249	-3.277	-3.306	-3.334	-3.363	-3.391	-3.419	-70
-60	-2.845	-2.874	-2.903	-2.932	-2.961	-2.990	-3.019	-3.048	-3.077	-3.106	-3.134	-60
-50	-2.552	-2.581	-2.611	-2.640	-2.670	-2.699	-2.728	-2.758	-2.787	-2.816	-2.845	-50
-40	-2.254	-2.284	-2.314	-2.344	-2.374	-2.404	-2.433	-2.463	-2.493	-2.522	-2.552	-40
-30	-1.953	-1.983	-2.014	-2.044	-2.074	-2.104	-2.134	-2.164	-2.194	-2.224	-2.254	-30
-20	-1.648	-1.678	-1.709	-1.740	-1.770	-1.801	-1.831	-1.862	-1.892	-1.923	-1.953	-20
-10	-1.339	-1.370	-1.401	-1.432	-1.463	-1.494	-1.525	-1.555	-1.586	-1.617	-1.648	-10
-0	-1.026	-1.057	-1.089	-1.120	-1.151	-1.183	-1.214	-1.245	-1.276	-1.308	-1.339	-0
0	-1.026	-0.994	-0.963	-0.931	-0.900	-0.868	-0.836	-0.805	-0.773	-0.741	-0.709	0
10	-0.709	-0.677	-0.645	-0.613	-0.581	-0.549	-0.517	-0.485	-0.453	-0.421	-0.389	10
20	-0.389	-0.357	-0.324	-0.292	-0.260	-0.227	-0.195	-0.163	-0.130	-0.098	-0.065	20
30	-0.065	-0.033	0.000	0.033	0.065	0.098	0.131	0.163	0.196	0.229	0.262	30
40	0.262	0.295	0.327	0.360	0.393	0.426	0.459	0.492	0.525	0.558	0.591	40
50	0.591	0.624	0.658	0.691	0.724	0.757	0.790	0.824	0.857	0.890	0.924	50
60	0.924	0.957	0.990	1.024	1.057	1.091	1.124	1.158	1.192	1.225	1.259	60
70	1.259	1.292	1.326	1.360	1.394	1.427	1.461	1.495	1.529	1.563	1.597	70
80	1.597	1.631	1.665	1.699	1.733	1.767	1.801	1.835	1.869	1.903	1.937	80
90	1.937	1.972	2.006	2.040	2.075	2.109	2.143	2.178	2.212	2.247	2.281	90
100	2.281	2.316	2.350	2.385	2.419	2.454	2.489	2.523	2.558	2.593	2.627	100
110	2.627	2.662	2.697	2.732	2.767	2.802	2.837	2.872	2.907	2.942	2.977	110
120	2.977	3.012	3.047	3.082	3.117	3.152	3.187	3.223	3.258	3.293	3.329	120
130	3.329	3.364	3.399	3.435	3.470	3.506	3.541	3.577	3.612	3.648	3.683	130
140	3.683	3.719	3.755	3.790	3.826	3.862	3.898	3.933	3.969	4.005	4.041	140

* Converted from degrees Celsius (IPTS 1968)

TABLE 5 Type E Thermocouples Continued
 Temperature in Degrees Fahrenheit^a

EMF in Absolute Millivolts

Reference Junctions at 32 F

DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
150	4.041	4.077	4.113	4.149	4.185	4.221	4.257	4.293	4.329	4.365	4.401	150
160	4.401	4.437	4.474	4.510	4.546	4.582	4.619	4.655	4.691	4.728	4.764	160
170	4.764	4.801	4.837	4.874	4.910	4.947	4.983	5.020	5.056	5.093	5.130	170
180	5.130	5.166	5.203	5.240	5.277	5.314	5.350	5.387	5.424	5.461	5.498	180
190	5.498	5.535	5.572	5.609	5.646	5.683	5.720	5.757	5.794	5.832	5.869	190
200	5.869	5.906	5.943	5.981	6.018	6.055	6.092	6.130	6.167	6.205	6.242	200
210	6.242	6.280	6.317	6.355	6.392	6.430	6.467	6.505	6.543	6.580	6.618	210
220	6.618	6.656	6.693	6.731	6.769	6.807	6.845	6.882	6.920	6.958	6.996	220
230	6.996	7.034	7.072	7.110	7.148	7.186	7.224	7.262	7.300	7.339	7.377	230
240	7.377	7.415	7.453	7.491	7.530	7.568	7.606	7.645	7.683	7.721	7.760	240
250	7.760	7.798	7.837	7.875	7.914	7.952	7.991	8.029	8.068	8.106	8.145	250
260	8.145	8.184	8.222	8.261	8.300	8.338	8.377	8.416	8.455	8.494	8.532	260
270	8.532	8.571	8.610	8.649	8.688	8.727	8.766	8.805	8.844	8.883	8.922	270
280	8.922	8.961	9.000	9.039	9.078	9.118	9.157	9.196	9.235	9.274	9.314	280
290	9.314	9.353	9.392	9.432	9.471	9.510	9.550	9.589	9.629	9.668	9.708	290
300	9.708	9.747	9.787	9.826	9.866	9.905	9.945	9.984	10.024	10.064	10.103	300
310	10.103	10.143	10.183	10.223	10.262	10.302	10.342	10.382	10.421	10.461	10.501	310
320	10.501	10.541	10.581	10.621	10.661	10.701	10.741	10.781	10.821	10.861	10.901	320
330	10.901	10.941	10.981	11.021	11.061	11.101	11.142	11.182	11.222	11.262	11.302	330
340	11.302	11.343	11.383	11.423	11.464	11.504	11.544	11.585	11.625	11.665	11.706	340
350	11.706	11.746	11.787	11.827	11.868	11.908	11.949	11.989	12.030	12.070	12.111	350
360	12.111	12.152	12.192	12.233	12.273	12.314	12.355	12.396	12.436	12.477	12.518	360
370	12.518	12.559	12.599	12.640	12.681	12.722	12.763	12.804	12.844	12.885	12.926	370
380	12.926	12.967	13.008	13.049	13.090	13.131	13.172	13.213	13.254	13.295	13.336	380
390	13.336	13.377	13.419	13.460	13.501	13.542	13.583	13.624	13.666	13.707	13.748	390
400	13.748	13.789	13.831	13.872	13.913	13.955	13.996	14.037	14.079	14.120	14.161	400
410	14.161	14.203	14.244	14.286	14.327	14.368	14.410	14.451	14.493	14.534	14.576	410
420	14.576	14.618	14.659	14.701	14.742	14.784	14.826	14.867	14.909	14.950	14.992	420
430	14.992	15.034	15.076	15.117	15.159	15.201	15.243	15.284	15.326	15.368	15.410	430
440	15.410	15.451	15.493	15.535	15.577	15.619	15.661	15.703	15.745	15.787	15.829	440
450	15.829	15.871	15.912	15.954	15.996	16.038	16.080	16.123	16.165	16.207	16.249	450
460	16.249	16.291	16.333	16.375	16.417	16.459	16.501	16.544	16.586	16.628	16.670	460
470	16.670	16.712	16.755	16.797	16.839	16.881	16.924	16.966	17.008	17.051	17.093	470
480	17.093	17.135	17.178	17.220	17.262	17.305	17.347	17.389	17.432	17.474	17.517	480
490	17.517	17.559	17.602	17.644	17.687	17.729	17.772	17.814	17.857	17.899	17.942	490
500	17.942	17.984	18.027	18.070	18.112	18.155	18.197	18.240	18.283	18.325	18.368	500
510	18.368	18.411	18.453	18.496	18.539	18.581	18.624	18.667	18.710	18.752	18.795	510
520	18.795	18.838	18.881	18.924	18.966	19.009	19.052	19.095	19.138	19.181	19.223	520
530	19.223	19.266	19.309	19.352	19.395	19.438	19.481	19.524	19.567	19.610	19.653	530
540	19.653	19.696	19.739	19.782	19.825	19.868	19.911	19.954	19.997	20.040	20.083	540
550	20.083	20.126	20.169	20.212	20.256	20.299	20.342	20.385	20.428	20.471	20.514	550
560	20.514	20.558	20.601	20.644	20.687	20.730	20.774	20.817	20.860	20.903	20.947	560
570	20.947	20.990	21.033	21.076	21.120	21.163	21.206	21.250	21.293	21.336	21.380	570
580	21.380	21.423	21.466	21.510	21.553	21.597	21.640	21.683	21.727	21.770	21.814	580
590	21.814	21.857	21.901	21.944	21.987	22.031	22.074	22.118	22.161	22.205	22.248	590
600	22.248	22.292	22.336	22.379	22.423	22.466	22.510	22.553	22.597	22.640	22.684	600
610	22.684	22.728	22.771	22.815	22.859	22.902	22.946	22.989	23.033	23.077	23.120	610
620	23.120	23.164	23.208	23.252	23.295	23.339	23.383	23.426	23.470	23.514	23.558	620
630	23.558	23.601	23.645	23.689	23.733	23.777	23.820	23.864	23.908	23.952	23.996	630
640	23.996	24.039	24.083	24.127	24.171	24.215	24.259	24.302	24.346	24.390	24.434	640
650	24.434	24.478	24.522	24.566	24.610	24.654	24.698	24.742	24.786	24.829	24.873	650
660	24.873	24.917	24.961	25.005	25.049	25.093	25.137	25.181	25.225	25.269	25.313	660
670	25.313	25.357	25.401	25.445	25.490	25.534	25.578	25.622	25.666	25.710	25.754	670
680	25.754	25.798	25.842	25.886	25.930	25.974	26.019	26.063	26.107	26.151	26.195	680
690	26.195	26.239	26.283	26.328	26.372	26.416	26.460	26.504	26.549	26.593	26.637	690
700	26.637	26.681	26.725	26.770	26.814	26.858	26.902	26.947	26.991	27.035	27.079	700
710	27.079	27.124	27.168	27.212	27.256	27.301	27.345	27.389	27.434	27.478	27.522	710
720	27.522	27.566	27.611	27.655	27.699	27.744	27.788	27.832	27.877	27.921	27.966	720
730	27.966	28.010	28.054	28.099	28.143	28.187	28.232	28.276	28.321	28.365	28.409	730
740	28.409	28.454	28.498	28.543	28.587	28.632	28.676	28.720	28.765	28.809	28.854	740
750	28.854	28.898	28.943	28.987	29.032	29.076	29.121	29.165	29.210	29.254	29.299	750
760	29.299	29.343	29.388	29.432	29.477	29.521	29.566	29.610	29.655	29.699	29.744	760
770	29.744	29.788	29.833	29.878	29.922	29.967	30.011	30.056	30.100	30.145	30.190	770
780	30.190	30.234	30.279	30.323	30.368	30.412	30.457	30.502	30.546	30.591	30.636	780
790	30.636	30.680	30.725	30.769	30.814	30.859	30.903	30.948	30.993	31.037	31.082	790
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F

^a Converted from degrees Celsius (IPTS 1968)

TABLE 5 Type E Thermocouples Continued
Temperature in Degrees Fahrenheit^a

EMF in Absolute Millivolts												Reference Junctions at 32 F	
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F	
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS													
800	31.082	31.127	31.171	31.216	31.261	31.305	31.350	31.395	31.439	31.484	31.529	800	
810	31.529	31.573	31.618	31.663	31.707	31.752	31.797	31.842	31.886	31.931	31.976	810	
820	31.976	32.020	32.065	32.110	32.155	32.199	32.244	32.289	32.334	32.378	32.423	820	
830	32.423	32.468	32.513	32.557	32.602	32.647	32.692	32.736	32.781	32.826	32.871	830	
840	32.871	32.916	32.960	33.005	33.050	33.095	33.140	33.184	33.229	33.274	33.319	840	
850	33.319	33.364	33.408	33.453	33.498	33.543	33.588	33.632	33.677	33.722	33.767	850	
860	33.767	33.812	33.857	33.901	33.946	33.991	34.036	34.081	34.126	34.170	34.215	860	
870	34.215	34.260	34.305	34.350	34.395	34.440	34.484	34.529	34.574	34.619	34.664	870	
880	34.664	34.709	34.754	34.798	34.843	34.888	34.933	34.978	35.023	35.068	35.113	880	
890	35.113	35.157	35.202	35.247	35.292	35.337	35.382	35.427	35.472	35.517	35.562	890	
900	35.562	35.606	35.651	35.696	35.741	35.786	35.831	35.876	35.921	35.966	36.011	900	
910	36.011	36.056	36.100	36.145	36.190	36.235	36.280	36.325	36.370	36.415	36.460	910	
920	36.460	36.505	36.550	36.595	36.640	36.684	36.729	36.774	36.819	36.864	36.909	920	
930	36.909	36.954	36.999	37.044	37.089	37.134	37.179	37.224	37.269	37.314	37.358	930	
940	37.358	37.403	37.448	37.493	37.538	37.583	37.628	37.673	37.718	37.763	37.808	940	
950	37.808	37.853	37.898	37.943	37.988	38.033	38.078	38.123	38.168	38.213	38.257	950	
960	38.257	38.302	38.347	38.392	38.437	38.482	38.527	38.572	38.617	38.662	38.707	960	
970	38.707	38.752	38.797	38.842	38.887	38.932	38.977	39.022	39.067	39.112	39.157	970	
980	39.157	39.202	39.247	39.291	39.336	39.381	39.426	39.471	39.516	39.561	39.606	980	
990	39.606	39.651	39.696	39.741	39.786	39.831	39.876	39.921	39.966	40.011	40.056	990	
1,000	40.056	40.101	40.146	40.191	40.236	40.280	40.325	40.370	40.415	40.460	40.505	1,000	
1,010	40.505	40.550	40.595	40.640	40.685	40.730	40.775	40.820	40.865	40.910	40.955	1,010	
1,020	40.955	41.000	41.045	41.090	41.134	41.179	41.224	41.269	41.314	41.359	41.404	1,020	
1,030	41.404	41.449	41.494	41.539	41.584	41.629	41.674	41.719	41.764	41.808	41.853	1,030	
1,040	41.853	41.898	41.943	41.988	42.033	42.078	42.123	42.168	42.213	42.258	42.303	1,040	
1,050	42.303	42.348	42.392	42.437	42.482	42.527	42.572	42.617	42.662	42.707	42.752	1,050	
1,060	42.752	42.797	42.842	42.886	42.931	42.976	43.021	43.066	43.111	43.156	43.201	1,060	
1,070	43.201	43.246	43.290	43.335	43.380	43.425	43.470	43.515	43.560	43.605	43.650	1,070	
1,080	43.650	43.694	43.739	43.784	43.829	43.874	43.919	43.964	44.008	44.053	44.098	1,080	
1,090	44.098	44.143	44.188	44.233	44.278	44.322	44.367	44.412	44.457	44.502	44.547	1,090	
1,100	44.547	44.592	44.636	44.681	44.726	44.771	44.816	44.861	44.905	44.950	44.995	1,100	
1,110	44.995	45.040	45.085	45.130	45.174	45.219	45.264	45.309	45.354	45.398	45.443	1,110	
1,120	45.443	45.488	45.533	45.578	45.622	45.667	45.712	45.757	45.802	45.846	45.891	1,120	
1,130	45.891	45.936	45.981	46.025	46.070	46.115	46.160	46.205	46.249	46.294	46.339	1,130	
1,140	46.339	46.384	46.428	46.473	46.518	46.563	46.607	46.652	46.697	46.742	46.786	1,140	
1,150	46.786	46.831	46.876	46.921	46.965	47.010	47.055	47.099	47.144	47.189	47.234	1,150	
1,160	47.234	47.278	47.323	47.368	47.412	47.457	47.502	47.546	47.591	47.636	47.681	1,160	
1,170	47.681	47.725	47.770	47.815	47.859	47.904	47.949	47.993	48.038	48.083	48.127	1,170	
1,180	48.127	48.172	48.217	48.261	48.306	48.351	48.395	48.440	48.484	48.529	48.574	1,180	
1,190	48.574	48.618	48.663	48.708	48.752	48.797	48.842	48.886	48.931	48.975	49.020	1,190	
1,200	49.020	49.065	49.109	49.154	49.198	49.243	49.288	49.332	49.377	49.421	49.466	1,200	
1,210	49.466	49.510	49.555	49.600	49.644	49.689	49.733	49.778	49.822	49.867	49.911	1,210	
1,220	49.911	49.956	50.000	50.045	50.090	50.134	50.179	50.223	50.268	50.312	50.357	1,220	
1,230	50.357	50.401	50.446	50.490	50.535	50.579	50.624	50.668	50.713	50.757	50.802	1,230	
1,240	50.802	50.846	50.891	50.935	50.980	51.024	51.069	51.113	51.157	51.202	51.246	1,240	
1,250	51.246	51.291	51.335	51.380	51.424	51.469	51.513	51.557	51.602	51.646	51.691	1,250	
1,260	51.691	51.735	51.780	51.824	51.868	51.913	51.957	52.002	52.046	52.090	52.135	1,260	
1,270	52.135	52.179	52.223	52.268	52.312	52.357	52.401	52.445	52.490	52.534	52.578	1,270	
1,280	52.578	52.623	52.667	52.711	52.756	52.800	52.844	52.889	52.933	52.977	53.022	1,280	
1,290	53.022	53.066	53.110	53.155	53.199	53.243	53.288	53.332	53.376	53.420	53.465	1,290	
1,300	53.465	53.509	53.553	53.597	53.642	53.686	53.730	53.774	53.819	53.863	53.907	1,300	
1,310	53.907	53.951	53.996	54.040	54.084	54.128	54.173	54.217	54.261	54.305	54.349	1,310	
1,320	54.349	54.394	54.438	54.482	54.526	54.570	54.615	54.659	54.703	54.747	54.791	1,320	
1,330	54.791	54.835	54.880	54.924	54.968	55.012	55.056	55.100	55.145	55.189	55.233	1,330	
1,340	55.233	55.277	55.321	55.365	55.409	55.453	55.498	55.542	55.586	55.630	55.674	1,340	
1,350	55.674	55.718	55.762	55.806	55.850	55.894	55.938	55.982	56.026	56.071	56.115	1,350	
1,360	56.115	56.159	56.203	56.247	56.291	56.335	56.379	56.423	56.467	56.511	56.555	1,360	
1,370	56.555	56.599	56.643	56.687	56.731	56.775	56.819	56.863	56.907	56.951	56.995	1,370	
1,380	56.995	57.039	57.083	57.127	57.171	57.215	57.259	57.303	57.347	57.391	57.434	1,380	
1,390	57.434	57.478	57.522	57.566	57.610	57.654	57.698	57.742	57.786	57.830	57.873	1,390	
1,400	57.873	57.917	57.961	58.005	58.049	58.093	58.137	58.181	58.224	58.268	58.312	1,400	
1,410	58.312	58.356	58.400	58.444	58.488	58.531	58.575	58.619	58.663	58.707	58.750	1,410	
1,420	58.750	58.794	58.838	58.882	58.926	58.969	59.013	59.057	59.101	59.144	59.188	1,420	
1,430	59.188	59.232	59.276	59.319	59.363	59.407	59.451	59.494	59.538	59.582	59.626	1,430	
1,440	59.626	59.669	59.713	59.757	59.800	59.844	59.888	59.932	59.975	60.019	60.063	1,440	
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F	

^a Converted from degrees Celsius (IPTS 1968)

TABLE 5 Type E Thermocouples Continued
Temperature in Degrees Fahrenheit*

EMF in Absolute Millivolts											Reference Junctions at 32 F	
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
1,450	60.063	60.106	60.150	60.194	60.237	60.281	60.325	60.368	60.412	60.455	60.499	1,450
1,460	60.499	60.543	60.586	60.630	60.674	60.717	60.761	60.804	60.848	60.892	60.935	1,460
1,470	60.935	60.979	61.022	61.066	61.109	61.153	61.197	61.240	61.284	61.327	61.371	1,470
1,480	61.371	61.414	61.458	61.501	61.545	61.588	61.632	61.675	61.719	61.762	61.806	1,480
1,490	61.806	61.849	61.893	61.936	61.980	62.023	62.067	62.110	62.154	62.197	62.240	1,490
1,500	62.240	62.284	62.327	62.371	62.414	62.458	62.501	62.544	62.588	62.631	62.675	1,500
1,510	62.675	62.718	62.761	62.805	62.848	62.892	62.935	62.978	63.022	63.065	63.108	1,510
1,520	63.108	63.152	63.195	63.238	63.282	63.325	63.368	63.412	63.455	63.498	63.542	1,520
1,530	63.542	63.585	63.628	63.671	63.715	63.758	63.801	63.844	63.888	63.931	63.974	1,530
1,540	63.974	64.017	64.061	64.104	64.147	64.190	64.234	64.277	64.320	64.363	64.406	1,540
1,550	64.406	64.450	64.493	64.536	64.579	64.622	64.665	64.709	64.752	64.795	64.838	1,550
1,560	64.838	64.881	64.924	64.967	65.011	65.054	65.097	65.140	65.183	65.226	65.269	1,560
1,570	65.269	65.312	65.355	65.398	65.441	65.484	65.528	65.571	65.614	65.657	65.700	1,570
1,580	65.700	65.743	65.786	65.829	65.872	65.915	65.958	66.001	66.044	66.087	66.130	1,580
1,590	66.130	66.173	66.216	66.259	66.302	66.345	66.387	66.430	66.473	66.516	66.559	1,590
1,600	66.559	66.602	66.645	66.688	66.731	66.774	66.817	66.859	66.902	66.945	66.988	1,600
1,610	66.988	67.031	67.074	67.117	67.159	67.202	67.245	67.288	67.331	67.374	67.416	1,610
1,620	67.416	67.459	67.502	67.545	67.588	67.630	67.673	67.716	67.759	67.801	67.844	1,620
1,630	67.844	67.887	67.930	67.972	68.015	68.058	68.101	68.143	68.186	68.229	68.271	1,630
1,640	68.271	68.314	68.357	68.399	68.442	68.485	68.527	68.570	68.613	68.655	68.698	1,640
1,650	68.698	68.740	68.783	68.826	68.868	68.911	68.953	68.996	69.039	69.081	69.124	1,650
1,660	69.124	69.166	69.209	69.251	69.294	69.337	69.379	69.422	69.464	69.507	69.549	1,660
1,670	69.549	69.592	69.634	69.677	69.719	69.762	69.804	69.847	69.889	69.931	69.974	1,670
1,680	69.974	70.016	70.059	70.101	70.144	70.186	70.228	70.271	70.313	70.356	70.398	1,680
1,690	70.398	70.440	70.483	70.525	70.567	70.610	70.652	70.694	70.737	70.779	70.821	1,690
1,700	70.821	70.864	70.906	70.948	70.991	71.033	71.075	71.118	71.160	71.202	71.244	1,700
1,710	71.244	71.287	71.329	71.371	71.413	71.456	71.498	71.540	71.582	71.624	71.667	1,710
1,720	71.667	71.709	71.751	71.793	71.835	71.878	71.920	71.962	72.004	72.046	72.088	1,720
1,730	72.088	72.130	72.173	72.215	72.257	72.299	72.341	72.383	72.425	72.467	72.509	1,730
1,740	72.509	72.551	72.593	72.635	72.678	72.720	72.762	72.804	72.846	72.888	72.930	1,740
1,750	72.930	72.972	73.014	73.056	73.098	73.140	73.182	73.224	73.266	73.308	73.350	1,750
1,760	73.350	73.392	73.434	73.475	73.517	73.559	73.601	73.643	73.685	73.727	73.769	1,760
1,770	73.769	73.811	73.853	73.895	73.936	73.978	74.020	74.062	74.104	74.146	74.188	1,770
1,780	74.188	74.229	74.271	74.313	74.355	74.397	74.439	74.480	74.522	74.564	74.606	1,780
1,790	74.606	74.648	74.689	74.731	74.773	74.815	74.857	74.898	74.940	74.982	75.024	1,790
1,800	75.024	75.065	75.107	75.149	75.191	75.232	75.274	75.316	75.357	75.399	75.441	1,800
1,810	75.441	75.483	75.524	75.566	75.608	75.649	75.691	75.733	75.774	75.816	75.858	1,810
1,820	75.858	75.899	75.941	75.983	76.024	76.066	76.108	76.149	76.191	76.233	76.274	1,820
1,830	76.274	76.316	76.358									1,830
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F

* Converted from degrees Celsius (IPTS 1968).

TABLE 6 Type E Thermocouples
Temperature in Degrees Celsius (IPTS 1968)

EMF in Absolute Millivolts

Reference Junctions at 0 C

DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
-270	-9.835											-270
-260	-9.797	-9.802	-9.808	-9.813	-9.817	-9.821	-9.825	-9.828	-9.831	-9.833	-9.835	-260
-250	-9.719	-9.728	-9.737	-9.746	-9.754	-9.762	-9.770	-9.777	-9.784	-9.791	-9.797	-250
-240	-9.604	-9.617	-9.630	-9.642	-9.654	-9.666	-9.677	-9.688	-9.699	-9.709	-9.719	-240
-230	-9.455	-9.472	-9.488	-9.503	-9.519	-9.534	-9.549	-9.563	-9.577	-9.591	-9.604	-230
-220	-9.274	-9.293	-9.313	-9.332	-9.350	-9.368	-9.386	-9.404	-9.421	-9.438	-9.455	-220
-210	-9.063	-9.085	-9.107	-9.129	-9.151	-9.172	-9.193	-9.214	-9.234	-9.254	-9.274	-210
-200	-8.824	-8.850	-8.874	-8.899	-8.923	-8.947	-8.971	-8.994	-9.017	-9.040	-9.063	-200
-190	-8.561	-8.588	-8.615	-8.642	-8.669	-8.696	-8.722	-8.748	-8.774	-8.799	-8.824	-190
-180	-8.273	-8.303	-8.333	-8.362	-8.391	-8.420	-8.449	-8.477	-8.505	-8.533	-8.561	-180
-170	-7.963	-7.995	-8.027	-8.058	-8.090	-8.121	-8.152	-8.183	-8.213	-8.243	-8.273	-170
-160	-7.631	-7.665	-7.699	-7.733	-7.767	-7.800	-7.833	-7.866	-7.898	-7.931	-7.963	-160
-150	-7.279	-7.315	-7.351	-7.387	-7.422	-7.458	-7.493	-7.528	-7.562	-7.597	-7.631	-150
-140	-6.907	-6.945	-6.983	-7.020	-7.058	-7.095	-7.132	-7.169	-7.206	-7.243	-7.279	-140
-130	-6.516	-6.556	-6.596	-6.635	-6.675	-6.714	-6.753	-6.792	-6.830	-6.869	-6.907	-130
-120	-6.107	-6.149	-6.190	-6.231	-6.273	-6.314	-6.354	-6.395	-6.436	-6.476	-6.516	-120
-110	-5.680	-5.724	-5.767	-5.810	-5.853	-5.896	-5.938	-5.981	-6.023	-6.065	-6.107	-110
-100	-5.237	-5.282	-5.327	-5.371	-5.416	-5.460	-5.505	-5.549	-5.593	-5.637	-5.680	-100
-90	-4.777	-4.824	-4.870	-4.916	-4.963	-5.009	-5.055	-5.100	-5.146	-5.191	-5.237	-90
-80	-4.301	-4.350	-4.398	-4.446	-4.493	-4.541	-4.588	-4.636	-4.683	-4.730	-4.777	-80
-70	-3.811	-3.860	-3.910	-3.959	-4.009	-4.058	-4.107	-4.156	-4.204	-4.253	-4.301	-70
-60	-3.306	-3.357	-3.408	-3.459	-3.509	-3.560	-3.610	-3.661	-3.711	-3.761	-3.811	-60
-50	-2.787	-2.839	-2.892	-2.944	-2.996	-3.048	-3.100	-3.152	-3.203	-3.254	-3.306	-50
-40	-2.254	-2.308	-2.362	-2.416	-2.469	-2.522	-2.575	-2.628	-2.681	-2.734	-2.787	-40
-30	-1.709	-1.764	-1.819	-1.874	-1.929	-1.983	-2.038	-2.092	-2.146	-2.200	-2.254	-30
-20	-1.151	-1.208	-1.264	-1.320	-1.376	-1.432	-1.487	-1.543	-1.599	-1.654	-1.709	-20
-10	-0.581	-0.639	-0.696	-0.754	-0.811	-0.868	-0.925	-0.982	-1.038	-1.095	-1.151	-10
-0	0.000	-0.059	-0.117	-0.176	-0.234	-0.292	-0.350	-0.408	-0.466	-0.524	-0.581	-0
0	0.000	0.059	0.118	0.176	0.235	0.295	0.354	0.413	0.472	0.532	0.591	0
10	0.591	0.651	0.711	0.770	0.830	0.890	0.950	1.011	1.071	1.131	1.192	10
20	1.192	1.252	1.313	1.373	1.434	1.495	1.556	1.617	1.678	1.739	1.801	20
30	1.801	1.862	1.924	1.985	2.047	2.109	2.171	2.233	2.295	2.357	2.419	30
40	2.419	2.482	2.544	2.607	2.669	2.732	2.795	2.858	2.921	2.984	3.047	40
50	3.047	3.110	3.173	3.237	3.300	3.364	3.428	3.491	3.555	3.619	3.683	50
60	3.683	3.748	3.812	3.876	3.941	4.005	4.070	4.134	4.199	4.264	4.329	60
70	4.329	4.394	4.459	4.524	4.590	4.655	4.720	4.786	4.852	4.917	4.983	70
80	4.983	5.049	5.115	5.181	5.247	5.314	5.380	5.446	5.513	5.579	5.646	80
90	5.646	5.713	5.780	5.846	5.913	5.981	6.048	6.115	6.182	6.250	6.317	90
100	6.317	6.385	6.452	6.520	6.588	6.656	6.724	6.792	6.860	6.928	6.996	100
110	6.996	7.064	7.133	7.201	7.270	7.339	7.407	7.476	7.545	7.614	7.683	110
120	7.683	7.752	7.821	7.890	7.960	8.029	8.099	8.168	8.238	8.307	8.377	120
130	8.377	8.447	8.517	8.587	8.657	8.727	8.797	8.867	8.938	9.008	9.078	130
140	9.078	9.149	9.220	9.290	9.361	9.432	9.503	9.573	9.644	9.715	9.787	140
150	9.787	9.858	9.929	10.000	10.072	10.143	10.215	10.286	10.358	10.429	10.501	150
160	10.501	10.573	10.645	10.717	10.789	10.861	10.933	11.005	11.077	11.150	11.222	160
170	11.222	11.294	11.367	11.439	11.512	11.585	11.657	11.730	11.803	11.876	11.949	170
180	11.949	12.022	12.095	12.168	12.241	12.314	12.387	12.461	12.534	12.608	12.681	180
190	12.681	12.755	12.828	12.902	12.975	13.049	13.123	13.197	13.271	13.345	13.419	190
200	13.419	13.493	13.567	13.641	13.715	13.789	13.864	13.938	14.012	14.087	14.161	200
210	14.161	14.236	14.310	14.385	14.460	14.534	14.609	14.684	14.759	14.834	14.909	210
220	14.909	14.984	15.059	15.134	15.209	15.284	15.359	15.434	15.509	15.584	15.659	220
230	15.659	15.736	15.812	15.887	15.963	16.038	16.114	16.190	16.266	16.341	16.417	230
240	16.417	16.493	16.569	16.645	16.721	16.797	16.873	16.949	17.025	17.101	17.178	240
250	17.178	17.254	17.330	17.406	17.483	17.559	17.636	17.712	17.789	17.865	17.942	250
260	17.942	18.018	18.095	18.172	18.248	18.325	18.402	18.479	18.556	18.633	18.710	260
270	18.710	18.787	18.864	18.941	19.018	19.095	19.172	19.249	19.326	19.404	19.481	270
280	19.481	19.558	19.636	19.713	19.790	19.868	19.945	20.023	20.100	20.178	20.256	280
290	20.256	20.333	20.411	20.488	20.566	20.644	20.722	20.800	20.877	20.955	21.033	290
300	21.033	21.111	21.189	21.267	21.345	21.423	21.501	21.579	21.657	21.735	21.814	300
310	21.814	21.892	21.970	22.048	22.127	22.205	22.283	22.362	22.440	22.518	22.597	310
320	22.597	22.675	22.754	22.832	22.911	22.989	23.068	23.147	23.225	23.304	23.383	320
330	23.383	23.461	23.540	23.619	23.698	23.777	23.856	23.934	24.013	24.092	24.171	330
340	24.171	24.250	24.329	24.408	24.487	24.566	24.645	24.724	24.803	24.882	24.961	340
DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C

TABLE 6 Type E Thermocouples Continued

Temperature in Degrees Celsius (IPTS 1968)

EMF in Absolute Millivolts

Reference Junctions at 0 C

DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
350	24.961	25.041	25.120	25.199	25.278	25.357	25.437	25.516	25.595	25.675	25.754	350
360	25.754	25.833	25.913	25.992	26.072	26.151	26.230	26.310	26.389	26.469	26.549	360
370	26.549	26.628	26.708	26.787	26.867	26.947	27.026	27.106	27.186	27.265	27.345	370
380	27.345	27.425	27.504	27.584	27.664	27.744	27.824	27.903	27.983	28.063	28.143	380
390	28.143	28.223	28.303	28.383	28.463	28.543	28.623	28.703	28.783	28.863	28.943	390
400	28.943	29.023	29.103	29.183	29.263	29.343	29.423	29.503	29.584	29.664	29.744	400
410	29.744	29.824	29.904	29.984	30.065	30.145	30.225	30.305	30.386	30.466	30.546	410
420	30.546	30.627	30.707	30.787	30.868	30.948	31.028	31.109	31.189	31.270	31.350	420
430	31.350	31.430	31.511	31.591	31.672	31.752	31.833	31.913	31.994	32.074	32.155	430
440	32.155	32.235	32.316	32.396	32.477	32.557	32.638	32.719	32.799	32.880	32.960	440
450	32.960	33.041	33.122	33.202	33.283	33.364	33.444	33.525	33.605	33.686	33.767	450
460	33.767	33.848	33.928	34.009	34.090	34.170	34.251	34.332	34.413	34.493	34.574	460
470	34.574	34.655	34.736	34.816	34.897	34.978	35.059	35.140	35.220	35.301	35.382	470
480	35.382	35.463	35.544	35.624	35.705	35.786	35.867	35.948	36.029	36.109	36.190	480
490	36.190	36.271	36.352	36.433	36.514	36.595	36.675	36.756	36.837	36.918	36.999	490
500	36.999	37.080	37.161	37.242	37.323	37.403	37.484	37.565	37.646	37.727	37.808	500
510	37.808	37.889	37.970	38.051	38.132	38.213	38.293	38.374	38.455	38.536	38.617	510
520	38.617	38.698	38.779	38.860	38.941	39.022	39.103	39.184	39.264	39.345	39.426	520
530	39.426	39.507	39.588	39.669	39.750	39.831	39.912	39.993	40.074	40.155	40.236	530
540	40.236	40.316	40.397	40.478	40.559	40.640	40.721	40.802	40.883	40.964	41.045	540
550	41.045	41.125	41.206	41.287	41.368	41.449	41.530	41.611	41.692	41.773	41.853	550
560	41.853	41.934	42.015	42.096	42.177	42.258	42.339	42.419	42.500	42.581	42.662	560
570	42.662	42.743	42.824	42.904	42.985	43.066	43.147	43.228	43.308	43.389	43.470	570
580	43.470	43.551	43.632	43.712	43.793	43.874	43.955	44.035	44.116	44.197	44.278	580
590	44.278	44.358	44.439	44.520	44.601	44.681	44.762	44.843	44.923	45.004	45.085	590
600	45.085	45.165	45.246	45.327	45.407	45.488	45.569	45.649	45.730	45.811	45.891	600
610	45.891	45.972	46.052	46.133	46.213	46.294	46.375	46.455	46.536	46.616	46.697	610
620	46.697	46.777	46.858	46.938	47.019	47.099	47.180	47.260	47.341	47.421	47.502	620
630	47.502	47.582	47.663	47.743	47.824	47.904	47.984	48.065	48.145	48.226	48.306	630
640	48.306	48.386	48.467	48.547	48.627	48.708	48.788	48.868	48.949	49.029	49.109	640
650	49.109	49.189	49.270	49.350	49.430	49.510	49.591	49.671	49.751	49.831	49.911	650
660	49.911	49.992	50.072	50.152	50.232	50.312	50.392	50.472	50.553	50.633	50.713	660
670	50.713	50.793	50.873	50.953	51.033	51.113	51.193	51.273	51.353	51.433	51.513	670
680	51.513	51.593	51.673	51.753	51.833	51.913	51.993	52.073	52.153	52.233	52.313	680
690	52.313	52.392	52.472	52.552	52.632	52.711	52.791	52.871	52.951	53.031	53.110	690
700	53.110	53.190	53.270	53.350	53.429	53.509	53.589	53.668	53.748	53.828	53.907	700
710	53.907	53.987	54.066	54.146	54.226	54.305	54.385	54.464	54.544	54.623	54.703	710
720	54.703	54.782	54.862	54.941	55.021	55.100	55.180	55.259	55.339	55.418	55.498	720
730	55.498	55.577	55.656	55.736	55.815	55.894	55.974	56.053	56.132	56.212	56.291	730
740	56.291	56.370	56.449	56.529	56.608	56.687	56.766	56.845	56.924	57.004	57.083	740
750	57.083	57.162	57.241	57.320	57.399	57.478	57.557	57.636	57.715	57.794	57.873	750
760	57.873	57.952	58.031	58.110	58.189	58.268	58.347	58.426	58.505	58.584	58.663	760
770	58.663	58.742	58.820	58.899	58.978	59.057	59.136	59.214	59.293	59.372	59.451	770
780	59.451	59.529	59.608	59.687	59.765	59.844	59.923	60.001	60.080	60.159	60.237	780
790	60.237	60.316	60.394	60.473	60.551	60.630	60.708	60.787	60.865	60.944	61.022	790
800	61.022	61.101	61.179	61.258	61.336	61.414	61.493	61.571	61.649	61.728	61.806	800
810	61.806	61.884	61.962	62.041	62.119	62.197	62.275	62.353	62.432	62.510	62.588	810
820	62.588	62.666	62.744	62.822	62.900	62.978	63.056	63.134	63.212	63.290	63.368	820
830	63.368	63.446	63.524	63.602	63.680	63.758	63.836	63.914	63.992	64.069	64.147	830
840	64.147	64.225	64.303	64.380	64.458	64.536	64.614	64.691	64.769	64.847	64.924	840
850	64.924	65.002	65.080	65.157	65.235	65.312	65.390	65.467	65.545	65.622	65.700	850
860	65.700	65.777	65.855	65.932	66.009	66.087	66.164	66.241	66.319	66.396	66.473	860
870	66.473	66.551	66.628	66.705	66.782	66.859	66.937	67.014	67.091	67.168	67.245	870
880	67.245	67.322	67.399	67.476	67.553	67.630	67.707	67.784	67.861	67.938	68.015	880
890	68.015	68.092	68.169	68.246	68.323	68.399	68.476	68.553	68.630	68.706	68.783	890
900	68.783	68.860	68.936	69.013	69.090	69.166	69.243	69.320	69.396	69.473	69.549	900
910	69.549	69.626	69.702	69.779	69.855	69.931	70.008	70.084	70.161	70.237	70.313	910
920	70.313	70.390	70.466	70.542	70.618	70.694	70.771	70.847	70.923	70.999	71.075	920
930	71.075	71.151	71.227	71.304	71.380	71.456	71.532	71.608	71.683	71.759	71.835	930
940	71.835	71.911	71.987	72.063	72.139	72.215	72.290	72.366	72.442	72.518	72.593	940
950	72.593	72.669	72.745	72.820	72.896	72.972	73.047	73.123	73.199	73.274	73.350	950
960	73.350	73.425	73.501	73.576	73.652	73.727	73.802	73.878	73.953	74.029	74.104	960
970	74.104	74.179	74.255	74.330	74.405	74.480	74.556	74.631	74.706	74.781	74.857	970
980	74.857	74.932	75.007	75.082	75.157	75.232	75.307	75.382	75.458	75.533	75.608	980
990	75.608	75.683	75.758	75.833	75.908	75.983	76.058	76.133	76.208	76.283	76.358	990
1+000	76.358											1+000
DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C

TABLE 7 Type J Thermocouples

NOTE—The maximum recommended temperature limit for Type J thermocouples is 1400 F (760 C) as specified in Table 2. Extension of the Type J tables beyond 1400 F gives temperature-electromotive force data to 2192 F (1200 C). This extension is a mathematical extrapolation based on limited calibration data and caution should be exercised in its use. The basis for the extended curve is discussed in *NBS Monograph 125*.

It should be noted that limits of error for Type J thermocouples (Table 1) do not apply above 1400 F (760 C).

Temperature in Degrees Fahrenheit ^a												
EMF in Absolute Millivolts											Reference Junctions at 32 F	
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
-350	-8.137											-350
-340	-8.030	-8.041	-8.052	-8.063	-8.074	-8.085	-8.096	-8.106	-8.117	-8.127	-8.137	-340
-330	-7.915	-7.927	-7.938	-7.950	-7.962	-7.973	-7.985	-7.996	-8.008	-8.019	-8.030	-330
-320	-7.791	-7.803	-7.816	-7.829	-7.841	-7.854	-7.866	-7.878	-7.890	-7.903	-7.915	-320
-310	-7.659	-7.672	-7.686	-7.699	-7.712	-7.726	-7.739	-7.752	-7.765	-7.778	-7.791	-310
-300	-7.519	-7.533	-7.548	-7.562	-7.576	-7.590	-7.604	-7.618	-7.631	-7.645	-7.659	-300
-290	-7.372	-7.387	-7.402	-7.417	-7.432	-7.447	-7.461	-7.476	-7.490	-7.505	-7.519	-290
-280	-7.218	-7.234	-7.250	-7.265	-7.281	-7.296	-7.311	-7.327	-7.342	-7.357	-7.372	-280
-270	-7.057	-7.074	-7.090	-7.106	-7.122	-7.139	-7.155	-7.171	-7.187	-7.202	-7.218	-270
-260	-6.890	-6.907	-6.924	-6.941	-6.958	-6.974	-6.991	-7.008	-7.024	-7.041	-7.057	-260
-250	-6.716	-6.734	-6.751	-6.769	-6.786	-6.804	-6.821	-6.838	-6.856	-6.873	-6.890	-250
-240	-6.536	-6.554	-6.572	-6.591	-6.609	-6.627	-6.645	-6.663	-6.680	-6.698	-6.716	-240
-230	-6.350	-6.369	-6.388	-6.407	-6.425	-6.444	-6.462	-6.481	-6.499	-6.518	-6.536	-230
-220	-6.159	-6.178	-6.198	-6.217	-6.236	-6.255	-6.274	-6.293	-6.312	-6.331	-6.350	-220
-210	-5.962	-5.982	-6.002	-6.022	-6.041	-6.061	-6.081	-6.100	-6.120	-6.139	-6.159	-210
-200	-5.760	-5.780	-5.801	-5.821	-5.841	-5.861	-5.882	-5.902	-5.922	-5.942	-5.962	-200
-190	-5.553	-5.574	-5.594	-5.615	-5.636	-5.657	-5.678	-5.698	-5.719	-5.739	-5.760	-190
-180	-5.341	-5.362	-5.383	-5.405	-5.426	-5.447	-5.468	-5.490	-5.511	-5.532	-5.553	-180
-170	-5.124	-5.146	-5.168	-5.190	-5.211	-5.233	-5.255	-5.276	-5.298	-5.319	-5.341	-170
-160	-4.903	-4.925	-4.948	-4.970	-4.992	-5.014	-5.036	-5.058	-5.080	-5.102	-5.124	-160
-150	-4.678	-4.700	-4.723	-4.746	-4.768	-4.791	-4.813	-4.836	-4.858	-4.881	-4.903	-150
-140	-4.448	-4.471	-4.494	-4.517	-4.540	-4.563	-4.586	-4.609	-4.632	-4.655	-4.678	-140
-130	-4.215	-4.238	-4.262	-4.285	-4.309	-4.332	-4.355	-4.379	-4.402	-4.425	-4.448	-130
-120	-3.978	-4.001	-4.025	-4.049	-4.073	-4.097	-4.120	-4.144	-4.168	-4.191	-4.215	-120
-110	-3.737	-3.761	-3.785	-3.809	-3.833	-3.858	-3.882	-3.906	-3.930	-3.954	-3.978	-110
-100	-3.492	-3.517	-3.541	-3.566	-3.590	-3.615	-3.639	-3.664	-3.688	-3.712	-3.737	-100
-90	-3.245	-3.270	-3.294	-3.319	-3.344	-3.369	-3.394	-3.418	-3.443	-3.468	-3.492	-90
-80	-2.994	-3.019	-3.044	-3.069	-3.094	-3.120	-3.145	-3.170	-3.195	-3.220	-3.245	-80
-70	-2.740	-2.765	-2.791	-2.816	-2.842	-2.867	-2.892	-2.918	-2.943	-2.968	-2.994	-70
-60	-2.483	-2.509	-2.534	-2.560	-2.586	-2.612	-2.637	-2.663	-2.689	-2.714	-2.740	-60
-50	-2.223	-2.249	-2.275	-2.301	-2.327	-2.353	-2.379	-2.405	-2.431	-2.457	-2.483	-50
-40	-1.960	-1.987	-2.013	-2.039	-2.066	-2.092	-2.118	-2.144	-2.171	-2.197	-2.223	-40
-30	-1.695	-1.722	-1.748	-1.775	-1.802	-1.828	-1.855	-1.881	-1.908	-1.934	-1.960	-30
-20	-1.428	-1.455	-1.481	-1.508	-1.535	-1.562	-1.589	-1.615	-1.642	-1.669	-1.695	-20
-10	-1.158	-1.185	-1.212	-1.239	-1.266	-1.293	-1.320	-1.347	-1.374	-1.401	-1.428	-10
-0	-0.885	-0.913	-0.940	-0.967	-0.995	-1.022	-1.049	-1.076	-1.103	-1.131	-1.158	-0
0	-0.885	-0.858	-0.831	-0.803	-0.776	-0.748	-0.721	-0.694	-0.666	-0.639	-0.611	0
10	-0.611	-0.583	-0.556	-0.528	-0.501	-0.473	-0.445	-0.418	-0.390	-0.362	-0.334	10
20	-0.334	-0.307	-0.279	-0.251	-0.223	-0.195	-0.168	-0.140	-0.112	-0.084	-0.056	20
30	-0.056	-0.028	0.000	0.028	0.056	0.084	0.112	0.140	0.168	0.196	0.224	30
40	0.224	0.253	0.281	0.309	0.337	0.365	0.394	0.422	0.450	0.478	0.507	40
50	0.507	0.535	0.563	0.592	0.620	0.648	0.677	0.705	0.734	0.762	0.791	50
60	0.791	0.819	0.848	0.876	0.905	0.933	0.962	0.990	1.019	1.048	1.076	60
70	1.076	1.105	1.134	1.162	1.191	1.220	1.248	1.277	1.306	1.335	1.363	70
80	1.363	1.392	1.421	1.450	1.479	1.507	1.536	1.565	1.594	1.623	1.652	80
90	1.652	1.681	1.710	1.739	1.768	1.797	1.826	1.855	1.884	1.913	1.942	90
100	1.942	1.971	2.000	2.029	2.058	2.088	2.117	2.146	2.175	2.204	2.233	100
110	2.233	2.263	2.292	2.321	2.350	2.380	2.409	2.438	2.467	2.497	2.526	110
120	2.526	2.555	2.585	2.614	2.644	2.673	2.702	2.732	2.761	2.791	2.820	120
130	2.820	2.849	2.879	2.908	2.938	2.967	2.997	3.026	3.056	3.085	3.115	130
140	3.115	3.145	3.174	3.204	3.233	3.263	3.293	3.322	3.352	3.381	3.411	140
150	3.411	3.441	3.470	3.500	3.530	3.560	3.589	3.619	3.649	3.678	3.708	150
160	3.708	3.738	3.768	3.798	3.827	3.857	3.887	3.917	3.947	3.976	4.006	160
170	4.006	4.036	4.066	4.096	4.126	4.156	4.186	4.216	4.245	4.275	4.305	170
180	4.305	4.335	4.365	4.395	4.425	4.455	4.485	4.515	4.545	4.575	4.605	180
190	4.605	4.635	4.665	4.695	4.725	4.755	4.786	4.816	4.846	4.876	4.906	190

DEG F 0 1 2 3 4 5 6 7 8 9 10 DEG F

^a Converted from degrees Celsius (IPTS 1968).

TABLE 7 Type J Thermocouples Continued
Temperature in Degrees Fahrenheit^a

EMF in Absolute Millivolts											Reference Junctions at 32 F	
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
200	4.906	4.936	4.966	4.996	5.026	5.057	5.087	5.117	5.147	5.177	5.207	200
210	5.207	5.238	5.268	5.298	5.328	5.358	5.389	5.419	5.449	5.479	5.509	210
220	5.509	5.540	5.570	5.600	5.630	5.661	5.691	5.721	5.752	5.782	5.812	220
230	5.812	5.843	5.873	5.903	5.934	5.964	5.994	6.025	6.055	6.085	6.116	230
240	6.116	6.146	6.176	6.207	6.237	6.268	6.298	6.328	6.359	6.389	6.420	240
250	6.420	6.450	6.481	6.511	6.541	6.572	6.602	6.633	6.663	6.694	6.724	250
260	6.724	6.755	6.785	6.816	6.846	6.877	6.907	6.938	6.968	6.999	7.029	260
270	7.029	7.060	7.090	7.121	7.151	7.182	7.212	7.243	7.274	7.304	7.335	270
280	7.335	7.365	7.396	7.426	7.457	7.488	7.518	7.549	7.579	7.610	7.641	280
290	7.641	7.671	7.702	7.732	7.763	7.794	7.824	7.855	7.885	7.916	7.947	290
300	7.947	7.977	8.008	8.039	8.069	8.100	8.131	8.161	8.192	8.223	8.253	300
310	8.253	8.284	8.315	8.345	8.376	8.407	8.437	8.468	8.499	8.530	8.560	310
320	8.560	8.591	8.622	8.652	8.683	8.714	8.745	8.775	8.806	8.837	8.867	320
330	8.867	8.898	8.929	8.960	8.990	9.021	9.052	9.083	9.113	9.144	9.175	330
340	9.175	9.206	9.236	9.267	9.298	9.329	9.359	9.390	9.421	9.452	9.483	340
350	9.483	9.513	9.544	9.575	9.606	9.636	9.667	9.698	9.729	9.760	9.790	350
360	9.790	9.821	9.852	9.883	9.914	9.944	9.975	10.006	10.037	10.068	10.098	360
370	10.098	10.129	10.160	10.191	10.222	10.252	10.283	10.314	10.345	10.376	10.407	370
380	10.407	10.437	10.468	10.499	10.530	10.561	10.592	10.622	10.653	10.684	10.715	380
390	10.715	10.746	10.777	10.807	10.838	10.869	10.900	10.931	10.962	10.992	11.023	390
400	11.023	11.054	11.085	11.116	11.147	11.177	11.208	11.239	11.270	11.301	11.332	400
410	11.332	11.363	11.393	11.424	11.455	11.486	11.517	11.548	11.578	11.609	11.640	410
420	11.640	11.671	11.702	11.733	11.764	11.794	11.825	11.856	11.887	11.918	11.949	420
430	11.949	11.980	12.010	12.041	12.072	12.103	12.134	12.165	12.196	12.226	12.257	430
440	12.257	12.288	12.319	12.350	12.381	12.411	12.442	12.473	12.504	12.535	12.566	440
450	12.566	12.597	12.627	12.658	12.689	12.720	12.751	12.782	12.813	12.844	12.874	450
460	12.874	12.905	12.936	12.967	12.998	13.029	13.059	13.090	13.121	13.152	13.183	460
470	13.183	13.214	13.244	13.275	13.306	13.337	13.368	13.399	13.430	13.460	13.491	470
480	13.491	13.522	13.553	13.584	13.615	13.646	13.677	13.708	13.738	13.769	13.800	480
490	13.800	13.830	13.861	13.892	13.923	13.954	13.985	14.015	14.046	14.077	14.108	490
500	14.108	14.139	14.170	14.200	14.231	14.262	14.293	14.324	14.355	14.385	14.416	500
510	14.416	14.447	14.478	14.509	14.539	14.570	14.601	14.632	14.663	14.694	14.724	510
520	14.724	14.755	14.786	14.817	14.848	14.878	14.909	14.940	14.971	15.002	15.032	520
530	15.032	15.063	15.094	15.125	15.156	15.186	15.217	15.248	15.279	15.310	15.340	530
540	15.340	15.371	15.402	15.433	15.464	15.494	15.525	15.556	15.587	15.617	15.648	540
550	15.648	15.679	15.710	15.741	15.771	15.802	15.833	15.864	15.894	15.925	15.956	550
560	15.956	15.987	16.018	16.048	16.079	16.110	16.141	16.171	16.202	16.233	16.264	560
570	16.264	16.294	16.325	16.356	16.387	16.417	16.448	16.479	16.510	16.540	16.571	570
580	16.571	16.602	16.633	16.663	16.694	16.725	16.756	16.786	16.817	16.848	16.879	580
590	16.879	16.909	16.940	16.971	17.001	17.032	17.063	17.094	17.124	17.155	17.186	590
600	17.186	17.217	17.247	17.278	17.309	17.339	17.370	17.401	17.432	17.462	17.493	600
610	17.493	17.524	17.554	17.585	17.616	17.646	17.677	17.708	17.739	17.769	17.800	610
620	17.800	17.831	17.861	17.892	17.923	17.953	17.984	18.015	18.046	18.076	18.107	620
630	18.107	18.138	18.168	18.199	18.230	18.260	18.291	18.322	18.352	18.383	18.414	630
640	18.414	18.444	18.475	18.506	18.537	18.567	18.598	18.629	18.659	18.690	18.721	640
650	18.721	18.751	18.782	18.813	18.843	18.874	18.905	18.936	18.966	18.997	19.027	650
660	19.027	19.058	19.089	19.119	19.150	19.180	19.211	19.242	19.272	19.303	19.334	660
670	19.334	19.364	19.395	19.426	19.456	19.487	19.518	19.548	19.579	19.610	19.640	670
680	19.640	19.671	19.702	19.732	19.763	19.793	19.824	19.855	19.885	19.916	19.947	680
690	19.947	19.977	20.008	20.039	20.069	20.100	20.131	20.161	20.192	20.222	20.253	690
700	20.253	20.284	20.314	20.345	20.376	20.406	20.437	20.467	20.498	20.529	20.559	700
710	20.559	20.590	20.621	20.651	20.682	20.713	20.743	20.774	20.804	20.835	20.866	710
720	20.866	20.896	20.927	20.958	20.988	21.019	21.049	21.079	21.110	21.141	21.172	720
730	21.172	21.203	21.233	21.264	21.295	21.325	21.356	21.386	21.417	21.448	21.478	730
740	21.478	21.509	21.540	21.570	21.601	21.631	21.662	21.693	21.723	21.754	21.785	740
750	21.785	21.815	21.846	21.877	21.907	21.938	21.968	21.999	22.030	22.060	22.091	750
760	22.091	22.122	22.152	22.183	22.214	22.244	22.275	22.305	22.336	22.367	22.397	760
770	22.397	22.428	22.459	22.489	22.520	22.551	22.581	22.612	22.643	22.673	22.704	770
780	22.704	22.735	22.765	22.796	22.826	22.857	22.888	22.918	22.949	22.980	23.010	780
790	23.010	23.041	23.072	23.102	23.133	23.164	23.194	23.225	23.256	23.286	23.317	790
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F

^a Converted from degrees Celsius (NIST 1988)

TABLE 7 Type J Thermocouples Continued
Temperature in Degrees Fahrenheit*

EMF in Absolute Millivolts

Reference Junctions at 32 F

DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
800	23.317	23.348	23.378	23.409	23.440	23.471	23.501	23.532	23.563	23.593	23.624	800
810	23.624	23.655	23.685	23.716	23.747	23.777	23.808	23.839	23.870	23.900	23.931	810
820	23.931	23.962	23.992	24.023	24.054	24.085	24.115	24.146	24.177	24.207	24.238	820
830	24.238	24.269	24.300	24.330	24.361	24.392	24.423	24.453	24.484	24.515	24.546	830
840	24.546	24.576	24.607	24.638	24.669	24.699	24.730	24.761	24.792	24.822	24.853	840
850	24.853	24.884	24.915	24.946	24.976	25.007	25.038	25.069	25.099	25.130	25.161	850
860	25.161	25.192	25.223	25.254	25.284	25.315	25.346	25.377	25.408	25.438	25.469	860
870	25.469	25.500	25.531	25.562	25.593	25.623	25.654	25.685	25.716	25.747	25.778	870
880	25.778	25.809	25.840	25.870	25.901	25.932	25.963	25.994	26.025	26.056	26.087	880
890	26.087	26.118	26.148	26.179	26.210	26.241	26.272	26.303	26.334	26.365	26.396	890
900	26.396	26.427	26.458	26.489	26.520	26.551	26.582	26.613	26.644	26.675	26.705	900
910	26.705	26.736	26.767	26.798	26.829	26.860	26.891	26.922	26.953	26.985	27.016	910
920	27.016	27.047	27.078	27.109	27.140	27.171	27.202	27.233	27.264	27.295	27.326	920
930	27.326	27.357	27.388	27.419	27.450	27.482	27.513	27.544	27.575	27.606	27.637	930
940	27.637	27.668	27.699	27.731	27.762	27.793	27.824	27.855	27.886	27.917	27.949	940
950	27.949	27.980	28.011	28.042	28.073	28.105	28.136	28.167	28.198	28.230	28.261	950
960	28.261	28.292	28.323	28.355	28.386	28.417	28.448	28.480	28.511	28.542	28.573	960
970	28.573	28.605	28.636	28.667	28.699	28.730	28.761	28.793	28.824	28.855	28.887	970
980	28.887	28.918	28.950	28.981	29.012	29.044	29.075	29.107	29.138	29.169	29.201	980
990	29.201	29.232	29.264	29.295	29.327	29.358	29.390	29.421	29.452	29.484	29.515	990
1,000	29.515	29.547	29.578	29.610	29.642	29.673	29.705	29.736	29.768	29.799	29.831	1,000
1,010	29.831	29.862	29.894	29.926	29.957	29.989	30.020	30.052	30.084	30.115	30.147	1,010
1,020	30.147	30.179	30.210	30.242	30.274	30.305	30.337	30.369	30.400	30.432	30.464	1,020
1,030	30.464	30.496	30.527	30.559	30.591	30.623	30.654	30.686	30.718	30.750	30.782	1,030
1,040	30.782	30.813	30.845	30.877	30.909	30.941	30.973	31.005	31.036	31.068	31.100	1,040
1,050	31.100	31.132	31.164	31.196	31.228	31.260	31.292	31.324	31.356	31.388	31.420	1,050
1,060	31.420	31.452	31.484	31.516	31.548	31.580	31.612	31.644	31.676	31.708	31.740	1,060
1,070	31.740	31.772	31.804	31.836	31.868	31.901	31.933	31.965	31.997	32.029	32.061	1,070
1,080	32.061	32.094	32.126	32.158	32.190	32.222	32.255	32.287	32.319	32.351	32.384	1,080
1,090	32.384	32.416	32.448	32.480	32.513	32.545	32.577	32.610	32.642	32.674	32.707	1,090
1,100	32.707	32.739	32.772	32.804	32.836	32.869	32.901	32.934	32.966	32.999	33.031	1,100
1,110	33.031	33.064	33.096	33.129	33.161	33.194	33.226	33.259	33.291	33.324	33.356	1,110
1,120	33.356	33.389	33.422	33.454	33.487	33.519	33.552	33.585	33.617	33.650	33.683	1,120
1,130	33.683	33.715	33.748	33.781	33.814	33.846	33.879	33.912	33.945	33.977	34.010	1,130
1,140	34.010	34.043	34.076	34.109	34.141	34.174	34.207	34.240	34.273	34.306	34.339	1,140
1,150	34.339	34.372	34.405	34.437	34.470	34.503	34.536	34.569	34.602	34.635	34.668	1,150
1,160	34.668	34.701	34.734	34.767	34.801	34.834	34.867	34.900	34.933	34.966	34.999	1,160
1,170	34.999	35.032	35.065	35.099	35.132	35.165	35.198	35.231	35.265	35.298	35.331	1,170
1,180	35.331	35.364	35.398	35.431	35.464	35.498	35.531	35.564	35.598	35.631	35.664	1,180
1,190	35.664	35.698	35.731	35.764	35.798	35.831	35.865	35.898	35.932	35.965	35.999	1,190
1,200	35.999	36.032	36.066	36.099	36.133	36.166	36.200	36.233	36.267	36.301	36.334	1,200
1,210	36.334	36.368	36.401	36.435	36.469	36.502	36.536	36.570	36.603	36.637	36.671	1,210
1,220	36.671	36.705	36.738	36.772	36.806	36.840	36.873	36.907	36.941	36.975	37.009	1,220
1,230	37.009	37.043	37.076	37.110	37.144	37.178	37.212	37.246	37.280	37.314	37.348	1,230
1,240	37.348	37.382	37.416	37.450	37.484	37.518	37.552	37.586	37.620	37.654	37.688	1,240
1,250	37.688	37.722	37.756	37.790	37.825	37.859	37.893	37.927	37.961	37.995	38.030	1,250
1,260	38.030	38.064	38.098	38.132	38.167	38.201	38.235	38.269	38.304	38.338	38.372	1,260
1,270	38.372	38.407	38.441	38.475	38.510	38.544	38.578	38.613	38.647	38.682	38.716	1,270
1,280	38.716	38.751	38.785	38.819	38.854	38.888	38.923	38.957	38.992	39.027	39.061	1,280
1,290	39.061	39.096	39.130	39.165	39.199	39.234	39.269	39.303	39.338	39.373	39.407	1,290
1,300	39.407	39.442	39.477	39.511	39.546	39.581	39.615	39.650	39.685	39.720	39.754	1,300
1,310	39.754	39.789	39.824	39.859	39.894	39.928	39.963	39.998	40.033	40.068	40.103	1,310
1,320	40.103	40.138	40.172	40.207	40.242	40.277	40.312	40.347	40.382	40.417	40.452	1,320
1,330	40.452	40.487	40.522	40.557	40.592	40.627	40.662	40.697	40.732	40.767	40.802	1,330
1,340	40.802	40.837	40.872	40.908	40.943	40.978	41.013	41.048	41.083	41.118	41.154	1,340
1,350	41.154	41.189	41.224	41.259	41.294	41.329	41.365	41.400	41.435	41.470	41.506	1,350
1,360	41.506	41.541	41.576	41.611	41.646	41.682	41.717	41.753	41.788	41.823	41.859	1,360
1,370	41.859	41.894	41.929	41.965	42.000	42.035	42.071	42.106	42.142	42.177	42.212	1,370
1,380	42.212	42.247	42.283	42.319	42.354	42.390	42.425	42.460	42.496	42.531	42.567	1,380
1,390	42.567	42.602	42.638	42.673	42.709	42.744	42.780	42.815	42.851	42.886	42.922	1,390
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F

* Converted from degrees Celsius (IP15 1968).

TABLE 7 Type J Thermocouples Continued

Temperature in Degrees Fahrenheit*

EMF in Absolute Millivolts

Reference Junctions at 32 F

DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
1.400	42.922	42.957	42.993	43.029	43.064	43.100	43.135	43.171	43.207	43.242	43.278	1.400
1.410	43.278	43.313	43.349	43.385	43.420	43.456	43.492	43.527	43.563	43.599	43.635	1.410
1.420	43.635	43.670	43.706	43.742	43.777	43.813	43.849	43.885	43.921	43.956	43.992	1.420
1.430	43.992	44.028	44.064	44.099	44.135	44.171	44.207	44.243	44.279	44.314	44.350	1.430
1.440	44.350	44.386	44.422	44.458	44.494	44.529	44.565	44.601	44.637	44.673	44.709	1.440
1.450	44.709	44.745	44.780	44.816	44.852	44.888	44.924	44.960	44.996	45.032	45.067	1.450
1.460	45.067	45.103	45.139	45.175	45.211	45.247	45.283	45.319	45.355	45.391	45.426	1.460
1.470	45.426	45.462	45.498	45.534	45.570	45.606	45.642	45.678	45.714	45.749	45.785	1.470
1.480	45.785	45.821	45.857	45.893	45.929	45.965	46.001	46.037	46.072	46.108	46.144	1.480
1.490	46.144	46.180	46.216	46.252	46.288	46.324	46.359	46.395	46.431	46.467	46.503	1.490
1.500	46.503	46.539	46.575	46.610	46.646	46.682	46.718	46.754	46.790	46.825	46.861	1.500
1.510	46.861	46.897	46.933	46.969	47.005	47.040	47.076	47.112	47.148	47.183	47.219	1.510
1.520	47.219	47.255	47.291	47.327	47.362	47.398	47.434	47.470	47.505	47.541	47.577	1.520
1.530	47.577	47.612	47.648	47.684	47.720	47.755	47.791	47.827	47.862	47.898	47.934	1.530
1.540	47.934	47.969	48.005	48.041	48.076	48.112	48.147	48.183	48.219	48.254	48.290	1.540
1.550	48.290	48.325	48.361	48.397	48.432	48.468	48.503	48.539	48.574	48.610	48.645	1.550
1.560	48.645	48.681	48.716	48.752	48.787	48.823	48.858	48.894	48.929	48.965	49.000	1.560
1.570	49.000	49.036	49.071	49.107	49.142	49.177	49.213	49.248	49.283	49.319	49.354	1.570
1.580	49.354	49.390	49.425	49.460	49.496	49.531	49.566	49.601	49.637	49.672	49.707	1.580
1.590	49.707	49.743	49.778	49.813	49.848	49.883	49.919	49.954	49.989	50.024	50.059	1.590
1.600	50.059	50.095	50.130	50.165	50.200	50.235	50.270	50.305	50.340	50.376	50.411	1.600
1.610	50.411	50.446	50.481	50.516	50.551	50.586	50.621	50.656	50.691	50.726	50.761	1.610
1.620	50.761	50.796	50.831	50.866	50.901	50.936	50.970	51.005	51.040	51.075	51.110	1.620
1.630	51.110	51.145	51.180	51.215	51.249	51.284	51.319	51.354	51.389	51.423	51.458	1.630
1.640	51.458	51.493	51.528	51.562	51.597	51.632	51.667	51.701	51.736	51.771	51.805	1.640
1.650	51.805	51.840	51.875	51.909	51.944	51.978	52.013	52.048	52.082	52.117	52.151	1.650
1.660	52.151	52.186	52.220	52.255	52.289	52.324	52.358	52.393	52.427	52.462	52.496	1.660
1.670	52.496	52.531	52.565	52.600	52.634	52.668	52.703	52.737	52.772	52.806	52.840	1.670
1.680	52.840	52.875	52.909	52.943	52.977	53.012	53.046	53.080	53.115	53.149	53.183	1.680
1.690	53.183	53.217	53.251	53.286	53.320	53.354	53.388	53.422	53.456	53.491	53.525	1.690
1.700	53.525	53.559	53.593	53.627	53.661	53.695	53.729	53.763	53.797	53.831	53.865	1.700
1.710	53.865	53.899	53.933	53.967	54.001	54.035	54.069	54.103	54.137	54.171	54.205	1.710
1.720	54.205	54.239	54.273	54.307	54.341	54.374	54.408	54.442	54.476	54.510	54.544	1.720
1.730	54.544	54.577	54.611	54.645	54.679	54.712	54.746	54.780	54.814	54.847	54.881	1.730
1.740	54.881	54.915	54.948	54.982	55.016	55.049	55.083	55.117	55.150	55.184	55.218	1.740
1.750	55.218	55.251	55.285	55.318	55.352	55.385	55.419	55.453	55.486	55.520	55.553	1.750
1.760	55.553	55.587	55.620	55.654	55.687	55.720	55.754	55.787	55.821	55.854	55.888	1.760
1.770	55.888	55.921	55.954	55.988	56.021	56.055	56.088	56.121	56.155	56.188	56.221	1.770
1.780	56.221	56.255	56.288	56.321	56.354	56.388	56.421	56.454	56.487	56.521	56.554	1.780
1.790	56.554	56.587	56.620	56.654	56.687	56.720	56.753	56.786	56.819	56.853	56.886	1.790
1.800	56.886	56.919	56.952	56.985	57.018	57.051	57.084	57.118	57.151	57.184	57.217	1.800
1.810	57.217	57.250	57.283	57.316	57.349	57.382	57.415	57.448	57.481	57.514	57.547	1.810
1.820	57.547	57.580	57.613	57.646	57.679	57.712	57.745	57.778	57.810	57.843	57.876	1.820
1.830	57.876	57.909	57.942	57.975	58.008	58.041	58.074	58.106	58.139	58.172	58.205	1.830
1.840	58.205	58.238	58.271	58.303	58.336	58.369	58.402	58.435	58.467	58.500	58.533	1.840
1.850	58.533	58.566	58.598	58.631	58.664	58.697	58.729	58.762	58.795	58.827	58.860	1.850
1.860	58.860	58.893	58.926	58.958	58.991	59.024	59.056	59.089	59.121	59.154	59.187	1.860
1.870	59.187	59.219	59.252	59.285	59.317	59.350	59.382	59.415	59.448	59.480	59.513	1.870
1.880	59.513	59.545	59.578	59.610	59.643	59.676	59.708	59.741	59.773	59.806	59.838	1.880
1.890	59.838	59.871	59.903	59.936	59.968	60.001	60.033	60.066	60.098	60.131	60.163	1.890
1.900	60.163	60.196	60.228	60.261	60.293	60.326	60.358	60.390	60.423	60.455	60.488	1.900
1.910	60.488	60.520	60.553	60.585	60.617	60.650	60.682	60.715	60.747	60.779	60.812	1.910
1.920	60.812	60.844	60.876	60.909	60.941	60.974	61.006	61.038	61.071	61.103	61.135	1.920
1.930	61.135	61.168	61.200	61.232	61.265	61.297	61.329	61.362	61.394	61.426	61.459	1.930
1.940	61.459	61.491	61.523	61.555	61.588	61.620	61.652	61.685	61.717	61.749	61.781	1.940
1.950	61.781	61.814	61.846	61.878	61.910	61.943	61.975	62.007	62.039	62.072	62.104	1.950
1.960	62.104	62.136	62.168	62.201	62.233	62.265	62.297	62.330	62.362	62.394	62.426	1.960
1.970	62.426	62.458	62.491	62.523	62.555	62.587	62.619	62.652	62.684	62.716	62.748	1.970
1.980	62.748	62.780	62.813	62.845	62.877	62.909	62.941	62.974	63.006	63.038	63.070	1.980
1.990	63.070	63.102	63.134	63.167	63.199	63.231	63.263	63.295	63.327	63.359	63.392	1.990
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F

* Converted from degrees Celsius (IPTS 1968).

TABLE 7 Type J Thermocouples Continued
Temperature in Degrees Fahrenheit*

EMF in Absolute Millivolts

Reference Junctions at 32 F

DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
2,000	63.392	63.424	63.456	63.488	63.520	63.552	63.584	63.617	63.649	63.681	63.713	2,000
2,010	63.713	63.745	63.777	63.809	63.842	63.874	63.906	63.938	63.970	64.002	64.034	2,010
2,020	64.034	64.066	64.098	64.131	64.163	64.195	64.227	64.259	64.291	64.323	64.355	2,020
2,030	64.355	64.387	64.420	64.452	64.484	64.516	64.548	64.580	64.612	64.644	64.676	2,030
2,040	64.676	64.708	64.740	64.773	64.805	64.837	64.869	64.901	64.933	64.965	64.997	2,040
2,050	64.997	65.029	65.061	65.093	65.125	65.158	65.190	65.222	65.254	65.286	65.318	2,050
2,060	65.318	65.350	65.382	65.414	65.446	65.478	65.510	65.542	65.574	65.606	65.638	2,060
2,070	65.638	65.671	65.703	65.735	65.767	65.799	65.831	65.863	65.895	65.927	65.959	2,070
2,080	65.959	65.991	66.023	66.055	66.087	66.119	66.151	66.183	66.215	66.247	66.279	2,080
2,090	66.279	66.311	66.343	66.375	66.407	66.439	66.472	66.504	66.536	66.568	66.600	2,090
2,100	66.600	66.632	66.664	66.696	66.728	66.760	66.792	66.824	66.856	66.888	66.920	2,100
2,110	66.920	66.952	66.984	67.016	67.048	67.080	67.112	67.144	67.176	67.208	67.240	2,110
2,120	67.240	67.272	67.304	67.336	67.368	67.400	67.432	67.464	67.495	67.527	67.559	2,120
2,130	67.559	67.591	67.623	67.655	67.687	67.719	67.751	67.783	67.815	67.847	67.879	2,130
2,140	67.879	67.911	67.943	67.975	68.007	68.039	68.071	68.103	68.134	68.166	68.198	2,140
2,150	68.198	68.230	68.262	68.294	68.326	68.358	68.390	68.422	68.454	68.486	68.517	2,150
2,160	68.517	68.549	68.581	68.613	68.645	68.677	68.709	68.741	68.772	68.804	68.836	2,160
2,170	68.836	68.868	68.900	68.932	68.964	68.995	69.027	69.059	69.091	69.123	69.155	2,170
2,180	69.155	69.186	69.218	69.250	69.282	69.314	69.345	69.377	69.409	69.441	69.472	2,180
2,190	69.472	69.504	69.536									2,190
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F

* Converted from degrees Celsius (IPTS 1968).

TABLE 8 Type J Thermocouples

NOTE—The maximum recommended temperature limit for Type J thermocouples is 1400 F (760 C) as specified in Table 2. Extension of the Type J tables beyond 1400 F gives temperature - electromotive force data to 2192 F (1200 C). This extension is a mathematical extrapolation based on limited calibration data and caution should be exercised in its use. The basis for the extended curve is discussed in *NBS Monograph 125*.

It should be noted that limits of error for Type J thermocouples (Table 1) do not apply above 1400 F (760 C).

EMF in Absolute Millivolts		Temperature in Degrees Celsius (IPTS 1968)										Reference Junctions at 0 C	
DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C	
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS													
-210	-8.096												-210
-200	-7.890	-7.912	-7.934	-7.955	-7.976	-7.996	-8.017	-8.037	-8.057	-8.076	-8.096		-200
-190	-7.659	-7.683	-7.707	-7.731	-7.755	-7.778	-7.801	-7.824	-7.846	-7.868	-7.890		-190
-180	-7.402	-7.429	-7.455	-7.482	-7.508	-7.533	-7.559	-7.584	-7.609	-7.634	-7.659		-180
-170	-7.122	-7.151	-7.180	-7.209	-7.237	-7.265	-7.293	-7.321	-7.348	-7.375	-7.402		-170
-160	-6.821	-6.852	-6.883	-6.914	-6.944	-6.974	-7.004	-7.034	-7.064	-7.093	-7.122		-160
-150	-6.499	-6.532	-6.565	-6.598	-6.630	-6.663	-6.695	-6.727	-6.758	-6.790	-6.821		-150
-140	-6.159	-6.194	-6.228	-6.263	-6.297	-6.331	-6.365	-6.399	-6.433	-6.466	-6.499		-140
-130	-5.801	-5.837	-5.874	-5.910	-5.946	-5.982	-6.018	-6.053	-6.089	-6.124	-6.159		-130
-120	-5.426	-5.464	-5.502	-5.540	-5.578	-5.615	-5.653	-5.690	-5.727	-5.764	-5.801		-120
-110	-5.036	-5.076	-5.115	-5.155	-5.194	-5.233	-5.272	-5.311	-5.349	-5.388	-5.426		-110
-100	-4.632	-4.673	-4.714	-4.755	-4.795	-4.836	-4.876	-4.916	-4.956	-4.996	-5.036		-100
-90	-4.215	-4.257	-4.299	-4.341	-4.383	-4.425	-4.467	-4.508	-4.550	-4.591	-4.632		-90
-80	-3.785	-3.829	-3.872	-3.915	-3.958	-4.001	-4.044	-4.087	-4.130	-4.172	-4.215		-80
-70	-3.344	-3.389	-3.433	-3.478	-3.522	-3.566	-3.610	-3.654	-3.698	-3.742	-3.785		-70
-60	-2.892	-2.938	-2.984	-3.029	-3.074	-3.120	-3.165	-3.210	-3.255	-3.299	-3.344		-60
-50	-2.431	-2.478	-2.524	-2.570	-2.617	-2.663	-2.709	-2.755	-2.801	-2.847	-2.892		-50
-40	-1.960	-2.008	-2.055	-2.102	-2.150	-2.197	-2.244	-2.291	-2.338	-2.384	-2.431		-40
-30	-1.481	-1.530	-1.578	-1.626	-1.674	-1.722	-1.770	-1.818	-1.865	-1.913	-1.960		-30
-20	-0.995	-1.044	-1.093	-1.141	-1.190	-1.239	-1.288	-1.336	-1.385	-1.433	-1.481		-20
-10	-0.501	-0.550	-0.600	-0.650	-0.699	-0.748	-0.798	-0.847	-0.896	-0.945	-0.995		-10
0	0.000	-0.050	-0.101	-0.151	-0.201	-0.251	-0.301	-0.351	-0.401	-0.451	-0.501		0
0	0.000	0.050	0.101	0.151	0.202	0.253	0.303	0.354	0.405	0.456	0.507		0
10	0.507	0.558	0.609	0.660	0.711	0.762	0.813	0.865	0.916	0.967	1.019		10
20	1.019	1.070	1.122	1.174	1.225	1.277	1.329	1.381	1.432	1.484	1.536		20
30	1.536	1.588	1.640	1.693	1.745	1.797	1.849	1.901	1.954	2.006	2.058		30
40	2.058	2.111	2.163	2.216	2.268	2.321	2.374	2.426	2.479	2.532	2.585		40
50	2.585	2.638	2.691	2.743	2.796	2.849	2.902	2.956	3.009	3.062	3.115		50
60	3.115	3.168	3.221	3.275	3.328	3.381	3.435	3.488	3.542	3.595	3.649		60
70	3.649	3.702	3.756	3.809	3.863	3.917	3.971	4.024	4.078	4.132	4.186		70
80	4.186	4.239	4.293	4.347	4.401	4.455	4.509	4.563	4.617	4.671	4.725		80
90	4.725	4.780	4.834	4.888	4.942	4.996	5.050	5.105	5.159	5.213	5.268		90
100	5.268	5.322	5.376	5.431	5.485	5.540	5.594	5.649	5.703	5.758	5.812		100
110	5.812	5.867	5.921	5.976	6.031	6.085	6.140	6.195	6.249	6.304	6.359		110
120	6.359	6.414	6.468	6.523	6.578	6.633	6.688	6.742	6.797	6.852	6.907		120
130	6.907	6.962	7.017	7.072	7.127	7.182	7.237	7.292	7.347	7.402	7.457		130
140	7.457	7.512	7.567	7.622	7.677	7.732	7.787	7.843	7.898	7.953	8.008		140
150	8.008	8.063	8.118	8.174	8.229	8.284	8.339	8.394	8.450	8.505	8.560		150
160	8.560	8.616	8.671	8.726	8.781	8.837	8.892	8.947	9.003	9.058	9.113		160
170	9.113	9.169	9.224	9.279	9.335	9.390	9.446	9.501	9.556	9.612	9.667		170
180	9.667	9.723	9.778	9.834	9.889	9.944	10.000	10.055	10.111	10.166	10.222		180
190	10.222	10.277	10.333	10.388	10.444	10.499	10.555	10.610	10.666	10.721	10.777		190
200	10.777	10.832	10.888	10.943	10.999	11.054	11.110	11.165	11.221	11.276	11.332		200
210	11.332	11.387	11.443	11.498	11.554	11.609	11.665	11.720	11.776	11.831	11.887		210
220	11.887	11.943	11.998	12.054	12.109	12.165	12.220	12.276	12.331	12.387	12.442		220
230	12.442	12.498	12.553	12.609	12.664	12.720	12.776	12.831	12.887	12.942	12.998		230
240	12.998	13.053	13.109	13.164	13.220	13.275	13.331	13.386	13.442	13.497	13.553		240
250	13.553	13.608	13.664	13.719	13.775	13.830	13.886	13.941	13.997	14.052	14.108		250
260	14.108	14.163	14.219	14.274	14.330	14.385	14.441	14.496	14.552	14.607	14.663		260
270	14.663	14.718	14.774	14.829	14.885	14.940	14.995	15.051	15.106	15.162	15.217		270
280	15.217	15.273	15.328	15.383	15.439	15.494	15.550	15.605	15.661	15.716	15.771		280
290	15.771	15.827	15.882	15.938	15.993	16.048	16.104	16.159	16.214	16.270	16.325		290
300	16.325	16.380	16.436	16.491	16.547	16.602	16.657	16.713	16.768	16.823	16.879		300
310	16.879	16.934	16.989	17.044	17.100	17.155	17.210	17.266	17.321	17.376	17.432		310
320	17.432	17.487	17.542	17.597	17.653	17.708	17.763	17.818	17.874	17.929	17.984		320
330	17.984	18.039	18.095	18.150	18.205	18.260	18.316	18.371	18.426	18.481	18.537		330
340	18.537	18.592	18.647	18.702	18.757	18.813	18.868	18.923	18.978	19.033	19.089		340
DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C	

TABLE 8 Type J Thermocouples Continued
Temperature in Degrees Celsius (IPTS 1968)

EMF in Absolute Millivolts

Reference Junctions at 0 C

DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
350	19.089	19.144	19.199	19.254	19.309	19.364	19.420	19.475	19.530	19.585	19.640	350
360	19.640	19.695	19.751	19.806	19.861	19.916	19.971	20.026	20.081	20.137	20.192	360
370	20.192	20.247	20.302	20.357	20.412	20.467	20.523	20.578	20.633	20.688	20.743	370
380	20.743	20.798	20.853	20.909	20.964	21.019	21.074	21.129	21.184	21.239	21.295	380
390	21.295	21.350	21.405	21.460	21.515	21.570	21.625	21.680	21.736	21.791	21.846	390
400	21.846	21.901	21.956	22.011	22.066	22.122	22.177	22.232	22.287	22.342	22.397	400
410	22.397	22.453	22.508	22.563	22.618	22.673	22.728	22.784	22.839	22.894	22.949	410
420	22.949	23.004	23.060	23.115	23.170	23.225	23.280	23.336	23.391	23.446	23.501	420
430	23.501	23.556	23.612	23.667	23.722	23.777	23.833	23.888	23.943	23.999	24.054	430
440	24.054	24.109	24.164	24.220	24.275	24.330	24.386	24.441	24.496	24.552	24.607	440
450	24.607	24.662	24.718	24.773	24.829	24.884	24.939	24.995	25.050	25.106	25.161	450
460	25.161	25.217	25.272	25.327	25.383	25.438	25.494	25.549	25.605	25.661	25.716	460
470	25.716	25.772	25.827	25.883	25.938	25.994	26.050	26.105	26.161	26.216	26.272	470
480	26.272	26.328	26.383	26.439	26.495	26.551	26.606	26.662	26.718	26.774	26.829	480
490	26.829	26.885	26.941	26.997	27.053	27.109	27.165	27.220	27.276	27.332	27.388	490
500	27.388	27.444	27.500	27.556	27.612	27.668	27.724	27.780	27.836	27.893	27.949	500
510	27.949	28.005	28.061	28.117	28.173	28.230	28.286	28.342	28.398	28.455	28.511	510
520	28.511	28.567	28.624	28.680	28.736	28.793	28.849	28.906	28.962	29.019	29.075	520
530	29.075	29.132	29.188	29.245	29.301	29.358	29.415	29.471	29.528	29.585	29.642	530
540	29.642	29.698	29.755	29.812	29.869	29.926	29.983	30.039	30.096	30.153	30.210	540
550	30.210	30.267	30.324	30.381	30.439	30.496	30.553	30.610	30.667	30.724	30.782	550
560	30.782	30.839	30.896	30.954	31.011	31.068	31.126	31.183	31.241	31.298	31.356	560
570	31.356	31.413	31.471	31.528	31.586	31.644	31.702	31.759	31.817	31.875	31.933	570
580	31.933	31.991	32.048	32.106	32.164	32.222	32.280	32.338	32.396	32.455	32.513	580
590	32.513	32.571	32.629	32.687	32.746	32.804	32.862	32.921	32.979	33.038	33.096	590
600	33.096	33.155	33.213	33.272	33.330	33.389	33.448	33.506	33.565	33.624	33.683	600
610	33.683	33.742	33.800	33.859	33.918	33.977	34.036	34.095	34.155	34.214	34.273	610
620	34.273	34.332	34.391	34.451	34.510	34.569	34.628	34.688	34.748	34.807	34.867	620
630	34.867	34.926	34.986	35.046	35.105	35.165	35.225	35.285	35.344	35.404	35.464	630
640	35.464	35.524	35.584	35.644	35.704	35.764	35.825	35.885	35.945	36.005	36.066	640
650	36.066	36.126	36.186	36.247	36.307	36.368	36.428	36.489	36.549	36.610	36.671	650
660	36.671	36.732	36.792	36.853	36.914	36.975	37.036	37.097	37.158	37.219	37.280	660
670	37.280	37.341	37.402	37.463	37.525	37.586	37.647	37.709	37.770	37.831	37.893	670
680	37.893	37.954	38.016	38.078	38.139	38.201	38.262	38.324	38.386	38.448	38.510	680
690	38.510	38.572	38.633	38.695	38.757	38.819	38.882	38.944	39.006	39.068	39.130	690
700	39.130	39.192	39.255	39.317	39.379	39.442	39.504	39.567	39.629	39.692	39.754	700
710	39.754	39.817	39.880	39.942	40.005	40.068	40.131	40.193	40.256	40.319	40.382	710
720	40.382	40.445	40.508	40.571	40.634	40.697	40.760	40.823	40.886	40.950	41.013	720
730	41.013	41.076	41.139	41.203	41.266	41.329	41.393	41.456	41.520	41.583	41.647	730
740	41.647	41.710	41.774	41.837	41.901	41.965	42.028	42.092	42.156	42.219	42.283	740
750	42.283	42.347	42.411	42.475	42.538	42.602	42.666	42.730	42.794	42.858	42.922	750
760	42.922											760
760	42.922	42.986	43.050	43.114	43.178	43.242	43.306	43.370	43.435	43.499	43.563	760
770	43.563	43.627	43.692	43.756	43.820	43.885	43.949	44.014	44.078	44.142	44.207	770
780	44.207	44.271	44.336	44.400	44.465	44.529	44.594	44.658	44.723	44.788	44.852	780
790	44.852	44.917	44.981	45.046	45.111	45.175	45.240	45.304	45.369	45.434	45.498	790
800	45.498	45.563	45.627	45.692	45.757	45.821	45.886	45.950	46.015	46.080	46.144	800
810	46.144	46.209	46.273	46.338	46.403	46.467	46.532	46.596	46.661	46.725	46.790	810
820	46.790	46.854	46.919	46.983	47.047	47.112	47.176	47.241	47.305	47.369	47.434	820
830	47.434	47.498	47.562	47.627	47.691	47.755	47.819	47.884	47.948	48.012	48.076	830
840	48.076	48.140	48.204	48.269	48.333	48.397	48.461	48.525	48.589	48.653	48.716	840
850	48.716	48.780	48.844	48.908	48.972	49.036	49.099	49.163	49.227	49.291	49.354	850
860	49.354	49.418	49.481	49.545	49.608	49.672	49.735	49.799	49.862	49.926	49.989	860
870	49.989	50.052	50.116	50.179	50.242	50.305	50.369	50.432	50.495	50.558	50.621	870
880	50.621	50.684	50.747	50.810	50.873	50.936	50.999	51.061	51.124	51.187	51.249	880
890	51.249	51.312	51.375	51.437	51.500	51.562	51.625	51.687	51.750	51.812	51.875	890
900	51.875	51.937	51.999	52.061	52.124	52.186	52.248	52.310	52.372	52.434	52.496	900
910	52.496	52.558	52.620	52.682	52.744	52.806	52.868	52.929	52.991	53.053	53.115	910
920	53.115	53.176	53.238	53.299	53.361	53.422	53.484	53.545	53.607	53.668	53.729	920
930	53.729	53.791	53.852	53.913	53.974	54.035	54.096	54.157	54.219	54.280	54.341	930
940	54.341	54.401	54.462	54.523	54.584	54.645	54.706	54.766	54.827	54.888	54.948	940
950	54.948	55.009	55.070	55.130	55.191	55.251	55.312	55.372	55.432	55.493	55.553	950
960	55.553	55.613	55.674	55.734	55.794	55.854	55.914	55.974	56.035	56.095	56.155	960
970	56.155	56.215	56.275	56.334	56.394	56.454	56.514	56.574	56.634	56.693	56.753	970
980	56.753	56.813	56.873	56.932	56.992	57.051	57.111	57.170	57.230	57.289	57.349	980
990	57.349	57.408	57.468	57.527	57.586	57.646	57.705	57.764	57.824	57.883	57.942	990

DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C
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TABLE 8 Type J Thermocouples Continued
Temperature in Degrees Celsius (ITS 1968)

EMF in Absolute Millivolts

Reference Junctions at 0 C

DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
1.000	57.942	58.001	58.060	58.120	58.179	58.238	58.297	58.356	58.415	58.474	58.533	1.000
1.010	58.533	58.592	58.651	58.710	58.769	58.827	58.886	58.945	59.004	59.063	59.121	1.010
1.020	59.121	59.180	59.239	59.298	59.356	59.415	59.474	59.532	59.591	59.650	59.708	1.020
1.030	59.708	59.767	59.825	59.884	59.942	60.001	60.059	60.118	60.176	60.235	60.293	1.030
1.040	60.293	60.351	60.410	60.468	60.527	60.585	60.643	60.702	60.760	60.818	60.876	1.040
1.050	60.876	60.935	60.993	61.051	61.109	61.168	61.226	61.284	61.342	61.400	61.459	1.050
1.060	61.459	61.517	61.575	61.633	61.691	61.749	61.807	61.865	61.923	61.981	62.039	1.060
1.070	62.039	62.097	62.156	62.214	62.272	62.330	62.388	62.446	62.504	62.562	62.619	1.070
1.080	62.619	62.677	62.735	62.793	62.851	62.909	62.967	63.025	63.083	63.141	63.199	1.080
1.090	63.199	63.257	63.314	63.372	63.430	63.488	63.546	63.604	63.662	63.719	63.777	1.090
1.100	63.777	63.835	63.893	63.951	64.009	64.066	64.124	64.182	64.240	64.298	64.355	1.100
1.110	64.355	64.413	64.471	64.529	64.586	64.644	64.702	64.760	64.817	64.875	64.933	1.110
1.120	64.933	64.991	65.048	65.106	65.164	65.222	65.279	65.337	65.395	65.453	65.510	1.120
1.130	65.510	65.568	65.626	65.683	65.741	65.799	65.856	65.914	65.972	66.029	66.087	1.130
1.140	66.087	66.145	66.202	66.260	66.318	66.375	66.433	66.491	66.548	66.606	66.664	1.140
1.150	66.664	66.721	66.779	66.836	66.894	66.952	67.009	67.067	67.124	67.182	67.240	1.150
1.160	67.240	67.297	67.355	67.412	67.470	67.527	67.585	67.643	67.700	67.758	67.815	1.160
1.170	67.815	67.873	67.930	67.988	68.045	68.103	68.160	68.217	68.275	68.332	68.390	1.170
1.180	68.390	68.447	68.505	68.562	68.619	68.677	68.734	68.792	68.849	68.906	68.964	1.180
1.190	68.964	69.021	69.078	69.135	69.193	69.250	69.307	69.364	69.422	69.479	69.536	1.190
1.200	69.536											1.200
DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C

TABLE 9 Type K Thermocouples
Temperature in Degrees Fahrenheit*

EMF in Absolute Millivolts

Reference Junctions at 32 F

DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
-450	-6.456	-6.456	-6.457	-6.457	-6.458							-450
-440	-6.447	-6.448	-6.449	-6.450	-6.451	-6.452	-6.453	-6.454	-6.454	-6.455	-6.456	-440
-430	-6.431	-6.433	-6.435	-6.436	-6.438	-6.440	-6.441	-6.443	-6.444	-6.445	-6.447	-430
-420	-6.409	-6.411	-6.414	-6.416	-6.419	-6.421	-6.423	-6.425	-6.427	-6.429	-6.431	-420
-410	-6.380	-6.383	-6.386	-6.389	-6.392	-6.395	-6.398	-6.401	-6.404	-6.406	-6.409	-410
-400	-6.344	-6.348	-6.352	-6.355	-6.359	-6.363	-6.366	-6.370	-6.373	-6.377	-6.380	-400
-390	-6.301	-6.306	-6.310	-6.315	-6.319	-6.323	-6.328	-6.332	-6.336	-6.340	-6.344	-390
-380	-6.251	-6.257	-6.262	-6.267	-6.272	-6.277	-6.282	-6.287	-6.292	-6.296	-6.301	-380
-370	-6.195	-6.201	-6.207	-6.213	-6.219	-6.224	-6.230	-6.235	-6.241	-6.246	-6.251	-370
-360	-6.133	-6.139	-6.146	-6.152	-6.158	-6.165	-6.171	-6.177	-6.183	-6.189	-6.195	-360
-350	-6.064	-6.071	-6.078	-6.085	-6.092	-6.099	-6.106	-6.113	-6.119	-6.126	-6.133	-350
-340	-5.989	-5.997	-6.004	-6.012	-6.020	-6.027	-6.035	-6.042	-6.049	-6.057	-6.064	-340
-330	-5.908	-5.917	-5.925	-5.933	-5.941	-5.949	-5.957	-5.965	-5.973	-5.981	-5.989	-330
-320	-5.822	-5.831	-5.839	-5.848	-5.857	-5.866	-5.874	-5.883	-5.891	-5.900	-5.908	-320
-310	-5.730	-5.739	-5.748	-5.758	-5.767	-5.776	-5.786	-5.795	-5.804	-5.813	-5.822	-310
-300	-5.632	-5.642	-5.652	-5.662	-5.672	-5.682	-5.691	-5.701	-5.711	-5.720	-5.730	-300
-290	-5.529	-5.540	-5.550	-5.561	-5.571	-5.581	-5.592	-5.602	-5.612	-5.622	-5.632	-290
-280	-5.421	-5.432	-5.443	-5.454	-5.465	-5.476	-5.487	-5.497	-5.508	-5.519	-5.529	-280
-270	-5.308	-5.319	-5.331	-5.342	-5.354	-5.365	-5.376	-5.388	-5.399	-5.410	-5.421	-270
-260	-5.190	-5.202	-5.214	-5.226	-5.238	-5.249	-5.261	-5.273	-5.285	-5.296	-5.308	-260
-250	-5.067	-5.079	-5.092	-5.104	-5.116	-5.129	-5.141	-5.153	-5.165	-5.178	-5.190	-250
-240	-4.939	-4.952	-4.965	-4.978	-4.990	-5.003	-5.016	-5.029	-5.041	-5.054	-5.067	-240
-230	-4.806	-4.819	-4.833	-4.846	-4.860	-4.873	-4.886	-4.899	-4.912	-4.926	-4.939	-230
-220	-4.669	-4.683	-4.697	-4.710	-4.724	-4.738	-4.752	-4.765	-4.779	-4.792	-4.806	-220
-210	-4.527	-4.541	-4.556	-4.570	-4.584	-4.598	-4.613	-4.627	-4.641	-4.655	-4.669	-210
-200	-4.381	-4.396	-4.410	-4.425	-4.440	-4.454	-4.469	-4.484	-4.498	-4.512	-4.527	-200
-190	-4.230	-4.245	-4.261	-4.276	-4.291	-4.306	-4.321	-4.336	-4.351	-4.366	-4.381	-190
-180	-4.075	-4.091	-4.107	-4.122	-4.138	-4.153	-4.169	-4.184	-4.200	-4.215	-4.230	-180
-170	-3.917	-3.933	-3.949	-3.965	-3.981	-3.997	-4.012	-4.028	-4.044	-4.060	-4.075	-170
-160	-3.754	-3.770	-3.787	-3.803	-3.819	-3.836	-3.852	-3.868	-3.884	-3.901	-3.917	-160
-150	-3.587	-3.604	-3.621	-3.637	-3.654	-3.671	-3.688	-3.704	-3.721	-3.737	-3.754	-150
-140	-3.417	-3.434	-3.451	-3.468	-3.485	-3.502	-3.519	-3.536	-3.553	-3.570	-3.587	-140
-130	-3.242	-3.260	-3.277	-3.295	-3.312	-3.330	-3.347	-3.365	-3.382	-3.399	-3.417	-130
-120	-3.065	-3.082	-3.100	-3.118	-3.136	-3.154	-3.172	-3.189	-3.207	-3.225	-3.242	-120
-110	-2.883	-2.902	-2.920	-2.938	-2.956	-2.974	-2.992	-3.010	-3.029	-3.047	-3.065	-110
-100	-2.699	-2.717	-2.736	-2.754	-2.773	-2.791	-2.810	-2.828	-2.847	-2.865	-2.883	-100
-90	-2.511	-2.530	-2.549	-2.567	-2.586	-2.605	-2.624	-2.643	-2.661	-2.680	-2.699	-90
-80	-2.320	-2.339	-2.358	-2.377	-2.397	-2.416	-2.435	-2.454	-2.473	-2.492	-2.511	-80
-70	-2.126	-2.145	-2.165	-2.184	-2.204	-2.223	-2.243	-2.262	-2.281	-2.300	-2.320	-70
-60	-1.929	-1.949	-1.968	-1.988	-2.008	-2.028	-2.047	-2.067	-2.087	-2.106	-2.126	-60
-50	-1.729	-1.749	-1.769	-1.789	-1.809	-1.829	-1.849	-1.869	-1.889	-1.909	-1.929	-50
-40	-1.527	-1.547	-1.567	-1.588	-1.608	-1.628	-1.648	-1.669	-1.689	-1.709	-1.729	-40
-30	-1.322	-1.342	-1.363	-1.383	-1.404	-1.424	-1.445	-1.465	-1.486	-1.506	-1.527	-30
-20	-1.114	-1.135	-1.156	-1.177	-1.197	-1.218	-1.239	-1.260	-1.280	-1.301	-1.322	-20
-10	-0.904	-0.925	-0.946	-0.968	-0.989	-1.010	-1.031	-1.051	-1.072	-1.093	-1.114	-10
-0	-0.692	-0.714	-0.735	-0.756	-0.777	-0.799	-0.820	-0.841	-0.862	-0.883	-0.904	-0
0	-0.692	-0.671	-0.650	-0.628	-0.607	-0.585	-0.564	-0.543	-0.521	-0.500	-0.478	0
10	-0.478	-0.457	-0.435	-0.413	-0.392	-0.370	-0.349	-0.327	-0.305	-0.284	-0.262	10
20	-0.262	-0.240	-0.218	-0.197	-0.175	-0.153	-0.131	-0.109	-0.088	-0.066	-0.044	20
30	-0.044	-0.022	0.000	0.022	0.044	0.066	0.088	0.110	0.132	0.154	0.176	30
40	0.176	0.198	0.220	0.242	0.264	0.286	0.308	0.331	0.353	0.375	0.397	40
50	0.397	0.419	0.441	0.464	0.486	0.508	0.530	0.553	0.575	0.597	0.619	50
60	0.619	0.642	0.664	0.686	0.709	0.731	0.753	0.776	0.798	0.821	0.843	60
70	0.843	0.865	0.888	0.910	0.933	0.955	0.978	1.000	1.023	1.045	1.068	70
80	1.068	1.090	1.113	1.135	1.158	1.181	1.203	1.226	1.248	1.271	1.294	80
90	1.294	1.316	1.339	1.362	1.384	1.407	1.430	1.452	1.475	1.498	1.520	90
100	1.520	1.543	1.566	1.589	1.611	1.634	1.657	1.680	1.703	1.725	1.748	100
110	1.748	1.771	1.794	1.817	1.839	1.862	1.885	1.908	1.931	1.954	1.977	110
120	1.977	2.000	2.022	2.045	2.068	2.091	2.114	2.137	2.160	2.183	2.206	120
130	2.206	2.229	2.252	2.275	2.298	2.321	2.344	2.367	2.390	2.413	2.436	130
140	2.436	2.459	2.482	2.505	2.528	2.551	2.574	2.597	2.620	2.643	2.666	140
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F

* Converted from degrees Celsius (IPTS 1968).

TABLE 9 Type K Thermocouples Continued

Temperature in Degrees Fahrenheit*

EMF in Absolute Millivolts

Reference Junctions at 32 F

DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
150	2.666	2.689	2.712	2.735	2.758	2.781	2.804	2.827	2.850	2.873	2.896	150
160	2.896	2.920	2.943	2.966	2.989	3.012	3.035	3.058	3.081	3.104	3.127	160
170	3.127	3.150	3.173	3.196	3.220	3.243	3.266	3.289	3.312	3.335	3.358	170
180	3.358	3.381	3.404	3.427	3.450	3.473	3.496	3.519	3.543	3.566	3.589	180
190	3.589	3.612	3.635	3.658	3.681	3.704	3.727	3.750	3.773	3.796	3.819	190
200	3.819	3.842	3.865	3.888	3.911	3.934	3.957	3.980	4.003	4.026	4.049	200
210	4.049	4.072	4.095	4.118	4.141	4.164	4.187	4.210	4.233	4.256	4.279	210
220	4.279	4.302	4.325	4.348	4.371	4.394	4.417	4.439	4.462	4.485	4.508	220
230	4.508	4.531	4.554	4.577	4.600	4.622	4.645	4.668	4.691	4.714	4.737	230
240	4.737	4.759	4.782	4.805	4.828	4.851	4.874	4.896	4.919	4.942	4.964	240
250	4.964	4.987	5.010	5.033	5.055	5.078	5.101	5.124	5.146	5.169	5.192	250
260	5.192	5.214	5.237	5.260	5.282	5.305	5.327	5.350	5.373	5.395	5.418	260
270	5.418	5.440	5.463	5.486	5.508	5.531	5.553	5.576	5.598	5.621	5.643	270
280	5.643	5.666	5.688	5.711	5.733	5.756	5.778	5.801	5.823	5.846	5.868	280
290	5.868	5.891	5.913	5.936	5.958	5.980	6.003	6.025	6.048	6.070	6.092	290
300	6.092	6.115	6.137	6.160	6.182	6.204	6.227	6.249	6.271	6.294	6.316	300
310	6.316	6.338	6.361	6.383	6.405	6.428	6.450	6.472	6.494	6.517	6.539	310
320	6.539	6.561	6.583	6.606	6.628	6.650	6.672	6.695	6.717	6.739	6.761	320
330	6.761	6.784	6.806	6.828	6.850	6.873	6.895	6.917	6.939	6.961	6.984	330
340	6.984	7.006	7.028	7.050	7.072	7.094	7.117	7.139	7.161	7.183	7.205	340
350	7.205	7.228	7.250	7.272	7.294	7.316	7.338	7.361	7.383	7.405	7.427	350
360	7.427	7.449	7.471	7.494	7.516	7.538	7.560	7.582	7.604	7.627	7.649	360
370	7.649	7.671	7.693	7.715	7.737	7.760	7.782	7.804	7.826	7.848	7.870	370
380	7.870	7.893	7.915	7.937	7.959	7.981	8.003	8.026	8.048	8.070	8.092	380
390	8.092	8.114	8.137	8.159	8.181	8.203	8.225	8.248	8.270	8.292	8.314	390
400	8.314	8.336	8.359	8.381	8.403	8.425	8.448	8.470	8.492	8.514	8.537	400
410	8.537	8.559	8.581	8.603	8.626	8.648	8.670	8.692	8.715	8.737	8.759	410
420	8.759	8.782	8.804	8.826	8.849	8.871	8.893	8.916	8.938	8.960	8.983	420
430	8.983	9.005	9.027	9.050	9.072	9.094	9.117	9.139	9.161	9.184	9.206	430
440	9.206	9.229	9.251	9.273	9.296	9.318	9.341	9.363	9.385	9.408	9.430	440
450	9.430	9.453	9.475	9.498	9.520	9.543	9.565	9.588	9.610	9.633	9.655	450
460	9.655	9.678	9.700	9.723	9.745	9.768	9.790	9.813	9.835	9.858	9.880	460
470	9.880	9.903	9.926	9.948	9.971	9.993	10.016	10.038	10.061	10.084	10.106	470
480	10.106	10.129	10.151	10.174	10.197	10.219	10.242	10.265	10.287	10.310	10.333	480
490	10.333	10.355	10.378	10.401	10.423	10.446	10.469	10.491	10.514	10.537	10.560	490
500	10.560	10.582	10.605	10.628	10.650	10.673	10.696	10.719	10.741	10.764	10.787	500
510	10.787	10.810	10.833	10.855	10.878	10.901	10.924	10.947	10.969	10.992	11.015	510
520	11.015	11.038	11.061	11.083	11.106	11.129	11.152	11.175	11.198	11.221	11.243	520
530	11.243	11.266	11.289	11.312	11.335	11.358	11.381	11.404	11.426	11.449	11.472	530
540	11.472	11.495	11.518	11.541	11.564	11.587	11.610	11.633	11.656	11.679	11.702	540
550	11.702	11.725	11.748	11.770	11.793	11.816	11.839	11.862	11.885	11.908	11.931	550
560	11.931	11.954	11.977	12.000	12.023	12.046	12.069	12.092	12.115	12.138	12.161	560
570	12.161	12.184	12.207	12.230	12.254	12.277	12.300	12.323	12.346	12.369	12.392	570
580	12.392	12.415	12.438	12.461	12.484	12.507	12.530	12.553	12.576	12.599	12.623	580
590	12.623	12.646	12.669	12.692	12.715	12.738	12.761	12.784	12.807	12.831	12.854	590
600	12.854	12.877	12.900	12.923	12.946	12.969	12.992	13.016	13.039	13.062	13.085	600
610	13.085	13.108	13.131	13.154	13.178	13.201	13.224	13.247	13.270	13.293	13.317	610
620	13.317	13.340	13.363	13.386	13.409	13.433	13.456	13.479	13.502	13.525	13.549	620
630	13.549	13.572	13.595	13.618	13.641	13.665	13.688	13.711	13.734	13.757	13.781	630
640	13.781	13.804	13.827	13.850	13.874	13.897	13.920	13.943	13.967	13.990	14.013	640
650	14.013	14.036	14.060	14.083	14.106	14.129	14.153	14.176	14.199	14.222	14.246	650
660	14.246	14.269	14.292	14.316	14.339	14.362	14.385	14.409	14.432	14.455	14.479	660
670	14.479	14.502	14.525	14.548	14.572	14.595	14.618	14.642	14.665	14.688	14.712	670
680	14.712	14.735	14.758	14.782	14.805	14.828	14.852	14.875	14.898	14.922	14.945	680
690	14.945	14.968	14.992	15.015	15.038	15.062	15.085	15.108	15.132	15.155	15.178	690
700	15.178	15.202	15.225	15.248	15.272	15.295	15.318	15.342	15.365	15.389	15.412	700
710	15.412	15.435	15.459	15.482	15.505	15.529	15.552	15.576	15.599	15.622	15.646	710
720	15.646	15.669	15.693	15.716	15.739	15.763	15.786	15.810	15.833	15.856	15.880	720
730	15.880	15.903	15.927	15.950	15.974	15.997	16.020	16.044	16.067	16.091	16.114	730
740	16.114	16.138	16.161	16.184	16.208	16.231	16.255	16.278	16.302	16.325	16.349	740
750	16.349	16.372	16.395	16.419	16.442	16.466	16.489	16.513	16.536	16.560	16.583	750
760	16.583	16.607	16.630	16.654	16.677	16.700	16.724	16.747	16.771	16.794	16.818	760
770	16.818	16.841	16.865	16.888	16.912	16.935	16.959	16.982	17.006	17.029	17.053	770
780	17.053	17.076	17.100	17.123	17.147	17.170	17.194	17.217	17.241	17.264	17.288	780
790	17.288	17.311	17.335	17.358	17.382	17.406	17.429	17.453	17.476	17.500	17.523	790

* Converted from degrees Celsius (IPTS 1968).

TABLE 9 Type K Thermocouples Continued

Temperature in Degrees Fahrenheit*

EMF in Absolute Millivolts

Reference Junctions at 32 F

DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
800	17.523	17.547	17.570	17.594	17.617	17.641	17.664	17.688	17.711	17.735	17.759	800
810	17.759	17.782	17.806	17.829	17.853	17.876	17.900	17.923	17.947	17.971	17.994	810
820	17.994	18.018	18.041	18.065	18.088	18.112	18.136	18.159	18.183	18.206	18.230	820
830	18.230	18.253	18.277	18.301	18.324	18.348	18.371	18.395	18.418	18.442	18.466	830
840	18.466	18.489	18.513	18.536	18.560	18.584	18.607	18.631	18.654	18.678	18.702	840
850	18.702	18.725	18.749	18.772	18.796	18.820	18.843	18.867	18.890	18.914	18.938	850
860	18.938	18.961	18.985	19.008	19.032	19.056	19.079	19.103	19.127	19.150	19.174	860
870	19.174	19.197	19.221	19.245	19.268	19.292	19.316	19.339	19.363	19.386	19.410	870
880	19.410	19.434	19.457	19.481	19.505	19.528	19.552	19.576	19.599	19.623	19.646	880
890	19.646	19.670	19.694	19.717	19.741	19.765	19.788	19.812	19.836	19.859	19.883	890
900	19.883	19.907	19.930	19.954	19.978	20.001	20.025	20.049	20.072	20.096	20.120	900
910	20.120	20.143	20.167	20.190	20.214	20.238	20.261	20.285	20.309	20.332	20.356	910
920	20.356	20.380	20.403	20.427	20.451	20.474	20.498	20.522	20.545	20.569	20.593	920
930	20.593	20.616	20.640	20.664	20.688	20.711	20.735	20.759	20.782	20.806	20.830	930
940	20.830	20.853	20.877	20.901	20.924	20.948	20.972	20.995	21.019	21.043	21.066	940
950	21.066	21.090	21.114	21.137	21.161	21.185	21.208	21.232	21.256	21.280	21.303	950
960	21.303	21.327	21.351	21.374	21.398	21.422	21.445	21.469	21.493	21.516	21.540	960
970	21.540	21.564	21.587	21.611	21.635	21.659	21.682	21.706	21.730	21.753	21.777	970
980	21.777	21.801	21.824	21.848	21.872	21.895	21.919	21.943	21.966	21.990	22.014	980
990	22.014	22.038	22.061	22.085	22.109	22.132	22.156	22.180	22.203	22.227	22.251	990
1000	22.251	22.274	22.298	22.322	22.346	22.369	22.393	22.417	22.440	22.464	22.488	1000
1010	22.488	22.511	22.535	22.559	22.582	22.606	22.630	22.654	22.677	22.701	22.725	1010
1020	22.725	22.748	22.772	22.796	22.819	22.843	22.867	22.890	22.914	22.938	22.961	1020
1030	22.961	22.985	23.009	23.032	23.056	23.080	23.104	23.127	23.151	23.175	23.198	1030
1040	23.198	23.222	23.246	23.269	23.293	23.317	23.340	23.364	23.388	23.411	23.435	1040
1050	23.435	23.459	23.482	23.506	23.530	23.553	23.577	23.601	23.624	23.648	23.672	1050
1060	23.672	23.695	23.719	23.743	23.766	23.790	23.814	23.837	23.861	23.885	23.908	1060
1070	23.908	23.932	23.956	23.979	24.003	24.027	24.050	24.074	24.098	24.121	24.145	1070
1080	24.145	24.169	24.192	24.216	24.240	24.263	24.287	24.311	24.334	24.358	24.382	1080
1090	24.382	24.405	24.429	24.453	24.476	24.500	24.523	24.547	24.571	24.594	24.618	1090
1100	24.618	24.642	24.665	24.689	24.713	24.736	24.760	24.783	24.807	24.831	24.854	1100
1110	24.854	24.878	24.902	24.925	24.949	24.972	24.996	25.020	25.043	25.067	25.091	1110
1120	25.091	25.114	25.138	25.161	25.185	25.209	25.232	25.256	25.279	25.303	25.327	1120
1130	25.327	25.350	25.374	25.397	25.421	25.445	25.468	25.492	25.515	25.539	25.563	1130
1140	25.563	25.586	25.610	25.633	25.657	25.681	25.704	25.728	25.751	25.775	25.799	1140
1150	25.799	25.822	25.846	25.869	25.893	25.916	25.940	25.964	25.987	26.011	26.034	1150
1160	26.034	26.058	26.081	26.105	26.128	26.152	26.176	26.199	26.223	26.246	26.270	1160
1170	26.270	26.293	26.317	26.340	26.364	26.387	26.411	26.435	26.458	26.482	26.505	1170
1180	26.505	26.529	26.552	26.576	26.599	26.623	26.646	26.670	26.693	26.717	26.740	1180
1190	26.740	26.764	26.787	26.811	26.834	26.858	26.881	26.905	26.928	26.952	26.975	1190
1200	26.975	26.999	27.022	27.046	27.069	27.093	27.116	27.140	27.163	27.187	27.210	1200
1210	27.210	27.234	27.257	27.281	27.304	27.328	27.351	27.375	27.398	27.422	27.445	1210
1220	27.445	27.468	27.492	27.515	27.539	27.562	27.586	27.609	27.633	27.656	27.679	1220
1230	27.679	27.703	27.726	27.750	27.773	27.797	27.820	27.843	27.867	27.890	27.914	1230
1240	27.914	27.937	27.961	27.984	28.007	28.031	28.054	28.078	28.101	28.124	28.148	1240
1250	28.148	28.171	28.195	28.218	28.241	28.265	28.288	28.311	28.335	28.358	28.382	1250
1260	28.382	28.405	28.428	28.452	28.475	28.498	28.522	28.545	28.569	28.592	28.615	1260
1270	28.615	28.639	28.662	28.685	28.709	28.732	28.755	28.779	28.802	28.825	28.849	1270
1280	28.849	28.872	28.895	28.919	28.942	28.965	28.988	29.012	29.035	29.058	29.082	1280
1290	29.082	29.105	29.128	29.152	29.175	29.198	29.221	29.245	29.268	29.291	29.315	1290
1300	29.315	29.338	29.361	29.384	29.408	29.431	29.454	29.477	29.501	29.524	29.547	1300
1310	29.547	29.570	29.594	29.617	29.640	29.663	29.687	29.710	29.733	29.756	29.780	1310
1320	29.780	29.803	29.826	29.849	29.872	29.896	29.919	29.942	29.965	29.989	30.012	1320
1330	30.012	30.035	30.058	30.081	30.104	30.128	30.151	30.174	30.197	30.220	30.244	1330
1340	30.244	30.267	30.290	30.313	30.336	30.359	30.383	30.406	30.429	30.452	30.475	1340
1350	30.475	30.498	30.521	30.545	30.568	30.591	30.614	30.637	30.660	30.683	30.706	1350
1360	30.706	30.730	30.753	30.776	30.799	30.822	30.845	30.868	30.891	30.914	30.937	1360
1370	30.937	30.961	30.984	31.007	31.030	31.053	31.076	31.099	31.122	31.145	31.168	1370
1380	31.168	31.191	31.214	31.237	31.260	31.283	31.306	31.329	31.353	31.376	31.399	1380
1390	31.399	31.422	31.445	31.468	31.491	31.514	31.537	31.560	31.583	31.606	31.629	1390
1400	31.629	31.652	31.675	31.698	31.721	31.744	31.767	31.790	31.813	31.836	31.859	1400
1410	31.859	31.882	31.905	31.927	31.950	31.973	31.996	32.019	32.042	32.065	32.088	1410
1420	32.088	32.111	32.134	32.157	32.180	32.203	32.226	32.249	32.272	32.295	32.317	1420
1430	32.317	32.340	32.363	32.386	32.409	32.432	32.455	32.478	32.501	32.523	32.546	1430
1440	32.546	32.569	32.592	32.615	32.638	32.661	32.683	32.706	32.729	32.752	32.775	1440
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F

*Converted from degrees Celsius (IPTS 1968).

TABLE 9 Type K Thermocouples Continued

Temperature in Degrees Fahrenheit*

EMF in Absolute Millivolts

Reference Junctions at 32 F

DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
1.450	32.775	32.798	32.821	32.843	32.866	32.889	32.912	32.935	32.958	32.980	33.003	1.450
1.460	33.003	33.026	33.049	33.072	33.094	33.117	33.140	33.163	33.186	33.208	33.231	1.460
1.470	33.231	33.254	33.277	33.300	33.322	33.345	33.368	33.391	33.413	33.436	33.459	1.470
1.480	33.459	33.482	33.504	33.527	33.550	33.573	33.595	33.618	33.641	33.664	33.686	1.480
1.490	33.686	33.709	33.732	33.754	33.777	33.800	33.823	33.845	33.868	33.891	33.913	1.490
1.500	33.913	33.936	33.959	33.981	34.004	34.027	34.049	34.072	34.095	34.117	34.140	1.500
1.510	34.140	34.163	34.185	34.208	34.231	34.253	34.276	34.299	34.321	34.344	34.366	1.510
1.520	34.366	34.389	34.412	34.434	34.457	34.480	34.502	34.525	34.547	34.570	34.593	1.520
1.530	34.593	34.615	34.638	34.660	34.683	34.705	34.728	34.751	34.773	34.796	34.818	1.530
1.540	34.818	34.841	34.863	34.886	34.909	34.931	34.954	34.976	34.999	35.021	35.044	1.540
1.550	35.044	35.066	35.089	35.111	35.134	35.156	35.179	35.201	35.224	35.246	35.269	1.550
1.560	35.269	35.291	35.314	35.336	35.359	35.381	35.404	35.426	35.449	35.471	35.494	1.560
1.570	35.494	35.516	35.539	35.561	35.583	35.606	35.628	35.651	35.673	35.696	35.718	1.570
1.580	35.718	35.741	35.763	35.785	35.808	35.830	35.853	35.875	35.897	35.920	35.942	1.580
1.590	35.942	35.965	35.987	36.009	36.032	36.054	36.077	36.099	36.121	36.144	36.166	1.590
1.600	36.166	36.188	36.211	36.233	36.256	36.278	36.300	36.323	36.345	36.367	36.390	1.600
1.610	36.390	36.412	36.434	36.457	36.479	36.501	36.524	36.546	36.568	36.590	36.613	1.610
1.620	36.613	36.635	36.657	36.680	36.702	36.724	36.746	36.769	36.791	36.813	36.836	1.620
1.630	36.836	36.858	36.880	36.902	36.925	36.947	36.969	36.991	37.014	37.036	37.058	1.630
1.640	37.058	37.080	37.103	37.125	37.147	37.169	37.191	37.214	37.236	37.258	37.280	1.640
1.650	37.280	37.303	37.325	37.347	37.369	37.391	37.413	37.436	37.458	37.480	37.502	1.650
1.660	37.502	37.524	37.547	37.569	37.591	37.613	37.635	37.657	37.679	37.702	37.724	1.660
1.670	37.724	37.746	37.768	37.790	37.812	37.834	37.857	37.879	37.901	37.923	37.945	1.670
1.680	37.945	37.967	37.989	38.011	38.033	38.055	38.078	38.100	38.122	38.144	38.166	1.680
1.690	38.166	38.188	38.210	38.232	38.254	38.276	38.298	38.320	38.342	38.364	38.387	1.690
1.700	38.387	38.409	38.431	38.453	38.475	38.497	38.519	38.541	38.563	38.585	38.607	1.700
1.710	38.607	38.629	38.651	38.673	38.695	38.717	38.739	38.761	38.783	38.805	38.827	1.710
1.720	38.827	38.849	38.871	38.893	38.915	38.937	38.959	38.981	39.003	39.024	39.046	1.720
1.730	39.046	39.068	39.090	39.112	39.134	39.156	39.178	39.200	39.222	39.244	39.266	1.730
1.740	39.266	39.288	39.310	39.331	39.353	39.375	39.397	39.419	39.441	39.463	39.485	1.740
1.750	39.485	39.507	39.529	39.550	39.572	39.594	39.616	39.638	39.660	39.682	39.703	1.750
1.760	39.703	39.725	39.747	39.769	39.791	39.813	39.835	39.856	39.878	39.900	39.922	1.760
1.770	39.922	39.944	39.966	39.987	40.009	40.031	40.053	40.075	40.096	40.118	40.140	1.770
1.780	40.140	40.162	40.183	40.205	40.227	40.249	40.271	40.292	40.314	40.336	40.358	1.780
1.790	40.358	40.379	40.401	40.423	40.445	40.466	40.488	40.510	40.532	40.553	40.575	1.790
1.800	40.575	40.597	40.619	40.640	40.662	40.684	40.705	40.727	40.749	40.770	40.792	1.800
1.810	40.792	40.814	40.836	40.857	40.879	40.901	40.922	40.944	40.966	40.987	41.009	1.810
1.820	41.009	41.031	41.052	41.074	41.096	41.117	41.139	41.161	41.182	41.204	41.225	1.820
1.830	41.225	41.247	41.269	41.290	41.312	41.334	41.355	41.377	41.398	41.420	41.442	1.830
1.840	41.442	41.463	41.485	41.506	41.528	41.550	41.571	41.593	41.614	41.636	41.657	1.840
1.850	41.657	41.679	41.701	41.722	41.744	41.765	41.787	41.808	41.830	41.851	41.873	1.850
1.860	41.873	41.895	41.916	41.938	41.959	41.981	42.002	42.024	42.045	42.067	42.088	1.860
1.870	42.088	42.110	42.131	42.153	42.174	42.196	42.217	42.239	42.260	42.282	42.303	1.870
1.880	42.303	42.325	42.346	42.367	42.389	42.410	42.432	42.453	42.475	42.496	42.518	1.880
1.890	42.518	42.539	42.560	42.582	42.603	42.625	42.646	42.668	42.689	42.710	42.732	1.890
1.900	42.732	42.753	42.775	42.796	42.817	42.839	42.860	42.882	42.903	42.924	42.946	1.900
1.910	42.946	42.967	42.989	43.010	43.031	43.053	43.074	43.095	43.117	43.138	43.159	1.910
1.920	43.159	43.181	43.202	43.223	43.245	43.266	43.287	43.309	43.330	43.351	43.373	1.920
1.930	43.373	43.394	43.415	43.436	43.458	43.479	43.500	43.522	43.543	43.564	43.585	1.930
1.940	43.585	43.607	43.628	43.649	43.671	43.692	43.713	43.734	43.756	43.777	43.798	1.940
1.950	43.798	43.819	43.841	43.862	43.883	43.904	43.925	43.947	43.968	43.989	44.010	1.950
1.960	44.010	44.031	44.053	44.074	44.095	44.116	44.137	44.159	44.180	44.201	44.222	1.960
1.970	44.222	44.243	44.265	44.286	44.307	44.328	44.349	44.370	44.391	44.413	44.434	1.970
1.980	44.434	44.455	44.476	44.497	44.518	44.539	44.560	44.582	44.603	44.624	44.645	1.980
1.990	44.645	44.666	44.687	44.708	44.729	44.750	44.771	44.793	44.814	44.835	44.856	1.990
2.000	44.856	44.877	44.898	44.919	44.940	44.961	44.982	45.003	45.024	45.045	45.066	2.000
2.010	45.066	45.087	45.108	45.129	45.150	45.171	45.192	45.213	45.234	45.255	45.276	2.010
2.020	45.276	45.297	45.318	45.339	45.360	45.381	45.402	45.423	45.444	45.465	45.486	2.020
2.030	45.486	45.507	45.528	45.549	45.570	45.591	45.612	45.633	45.654	45.675	45.695	2.030
2.040	45.695	45.716	45.737	45.758	45.779	45.800	45.821	45.842	45.863	45.884	45.904	2.040
2.050	45.904	45.925	45.946	45.967	45.988	46.009	46.030	46.051	46.071	46.092	46.113	2.050
2.060	46.113	46.134	46.155	46.176	46.196	46.217	46.238	46.259	46.280	46.300	46.321	2.060
2.070	46.321	46.342	46.363	46.384	46.404	46.425	46.446	46.467	46.488	46.508	46.529	2.070
2.080	46.529	46.550	46.571	46.591	46.612	46.633	46.654	46.674	46.695	46.716	46.737	2.080
2.090	46.737	46.757	46.778	46.799	46.819	46.840	46.861	46.881	46.902	46.923	46.944	2.090

DEG F 0 1 2 3 4 5 6 7 8 9 10 DEG F

* Converted from degrees Celsius (IP1S 1968)

TABLE 9 Type K Thermocouples Continued

Temperature in Degrees Fahrenheit*

EMF in Absolute Millivolts

Reference Junctions at 32 F

DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
2,100	46.944	46.964	46.985	47.006	47.026	47.047	47.068	47.088	47.109	47.130	47.150	2,100
2,110	47.150	47.171	47.191	47.212	47.233	47.253	47.274	47.295	47.315	47.336	47.356	2,110
2,120	47.356	47.377	47.398	47.418	47.439	47.459	47.480	47.500	47.521	47.542	47.562	2,120
2,130	47.562	47.583	47.603	47.624	47.644	47.665	47.685	47.706	47.726	47.747	47.767	2,130
2,140	47.767	47.788	47.808	47.829	47.849	47.870	47.890	47.911	47.931	47.952	47.972	2,140
2,150	47.972	47.993	48.013	48.034	48.054	48.075	48.095	48.116	48.136	48.156	48.177	2,150
2,160	48.177	48.197	48.218	48.238	48.258	48.279	48.299	48.320	48.340	48.360	48.381	2,160
2,170	48.381	48.401	48.422	48.442	48.462	48.483	48.503	48.523	48.544	48.564	48.584	2,170
2,180	48.584	48.605	48.625	48.645	48.666	48.686	48.706	48.727	48.747	48.767	48.787	2,180
2,190	48.787	48.808	48.828	48.848	48.869	48.889	48.909	48.929	48.950	48.970	48.990	2,190
2,200	48.990	49.010	49.031	49.051	49.071	49.091	49.111	49.132	49.152	49.172	49.192	2,200
2,210	49.192	49.212	49.233	49.253	49.273	49.293	49.313	49.333	49.354	49.374	49.394	2,210
2,220	49.394	49.414	49.434	49.454	49.474	49.495	49.515	49.535	49.555	49.575	49.595	2,220
2,230	49.595	49.615	49.635	49.655	49.675	49.696	49.716	49.736	49.756	49.776	49.796	2,230
2,240	49.796	49.816	49.836	49.856	49.876	49.896	49.916	49.936	49.956	49.976	49.996	2,240
2,250	49.996	50.016	50.036	50.056	50.076	50.096	50.116	50.136	50.156	50.176	50.196	2,250
2,260	50.196	50.216	50.236	50.256	50.276	50.296	50.315	50.335	50.355	50.375	50.395	2,260
2,270	50.395	50.415	50.435	50.455	50.475	50.494	50.514	50.534	50.554	50.574	50.594	2,270
2,280	50.594	50.614	50.633	50.653	50.673	50.693	50.713	50.733	50.752	50.772	50.792	2,280
2,290	50.792	50.812	50.832	50.851	50.871	50.891	50.911	50.930	50.950	50.970	50.990	2,290
2,300	50.990	51.009	51.029	51.049	51.069	51.088	51.108	51.128	51.148	51.167	51.187	2,300
2,310	51.187	51.207	51.226	51.246	51.266	51.285	51.305	51.325	51.344	51.364	51.384	2,310
2,320	51.384	51.403	51.423	51.443	51.462	51.482	51.501	51.521	51.541	51.560	51.580	2,320
2,330	51.580	51.599	51.619	51.639	51.658	51.678	51.697	51.717	51.736	51.756	51.776	2,330
2,340	51.776	51.795	51.815	51.834	51.854	51.873	51.893	51.912	51.932	51.951	51.971	2,340
2,350	51.971	51.990	52.010	52.029	52.049	52.068	52.088	52.107	52.127	52.146	52.165	2,350
2,360	52.165	52.185	52.204	52.224	52.243	52.263	52.282	52.301	52.321	52.340	52.360	2,360
2,370	52.360	52.379	52.398	52.418	52.437	52.457	52.476	52.495	52.515	52.534	52.553	2,370
2,380	52.553	52.573	52.592	52.611	52.631	52.650	52.669	52.689	52.708	52.727	52.747	2,380
2,390	52.747	52.766	52.785	52.805	52.824	52.843	52.862	52.882	52.901	52.920	52.939	2,390
2,400	52.939	52.959	52.978	52.997	53.016	53.036	53.055	53.074	53.093	53.113	53.132	2,400
2,410	53.132	53.151	53.170	53.189	53.209	53.228	53.247	53.266	53.285	53.304	53.324	2,410
2,420	53.324	53.343	53.362	53.381	53.400	53.419	53.439	53.458	53.477	53.496	53.515	2,420
2,430	53.515	53.534	53.553	53.572	53.592	53.611	53.630	53.649	53.668	53.687	53.706	2,430
2,440	53.706	53.725	53.744	53.763	53.782	53.801	53.821	53.840	53.859	53.878	53.897	2,440
2,450	53.897	53.916	53.935	53.954	53.973	53.992	54.011	54.030	54.049	54.068	54.087	2,450
2,460	54.087	54.106	54.125	54.144	54.163	54.182	54.201	54.220	54.239	54.258	54.277	2,460
2,470	54.277	54.296	54.315	54.334	54.353	54.372	54.391	54.410	54.429	54.447	54.466	2,470
2,480	54.466	54.485	54.504	54.523	54.542	54.561	54.580	54.599	54.618	54.637	54.656	2,480
2,490	54.656	54.675	54.694	54.712	54.731	54.750	54.769	54.788	54.807	54.826	54.845	2,490
2,500	54.845											2,500
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F

* Converted from degrees Celsius (IP1S 1968).

TABLE 10 Type K Thermocouples
Temperature in Degrees Celsius (IPTS 1968)

EMF in Absolute Millivolts

Reference Junctions at 0 C

DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
-270	-6.458											-270
-260	-6.441	-6.444	-6.446	-6.448	-6.450	-6.452	-6.453	-6.455	-6.456	-6.457	-6.458	-260
-250	-6.404	-6.408	-6.413	-6.417	-6.421	-6.425	-6.429	-6.432	-6.435	-6.438	-6.441	-250
-240	-6.344	-6.351	-6.358	-6.364	-6.371	-6.377	-6.382	-6.388	-6.394	-6.399	-6.404	-240
-230	-6.262	-6.271	-6.280	-6.289	-6.297	-6.306	-6.314	-6.322	-6.329	-6.337	-6.344	-230
-220	-6.158	-6.170	-6.181	-6.192	-6.202	-6.213	-6.223	-6.233	-6.243	-6.253	-6.262	-220
-210	-6.035	-6.048	-6.061	-6.074	-6.087	-6.099	-6.111	-6.123	-6.135	-6.147	-6.158	-210
-200	-5.891	-5.907	-5.922	-5.936	-5.951	-5.965	-5.980	-5.994	-6.007	-6.021	-6.035	-200
-190	-5.730	-5.747	-5.763	-5.780	-5.796	-5.813	-5.829	-5.845	-5.860	-5.876	-5.891	-190
-180	-5.550	-5.569	-5.587	-5.606	-5.624	-5.642	-5.660	-5.678	-5.695	-5.712	-5.730	-180
-170	-5.354	-5.374	-5.394	-5.414	-5.434	-5.454	-5.474	-5.493	-5.512	-5.531	-5.550	-170
-160	-5.141	-5.163	-5.185	-5.207	-5.228	-5.249	-5.271	-5.292	-5.313	-5.333	-5.354	-160
-150	-4.912	-4.936	-4.959	-4.983	-5.006	-5.029	-5.051	-5.074	-5.097	-5.119	-5.141	-150
-140	-4.669	-4.694	-4.719	-4.743	-4.768	-4.792	-4.817	-4.841	-4.865	-4.889	-4.912	-140
-130	-4.410	-4.437	-4.463	-4.489	-4.515	-4.541	-4.567	-4.593	-4.618	-4.644	-4.669	-130
-120	-4.138	-4.166	-4.193	-4.221	-4.248	-4.276	-4.303	-4.330	-4.357	-4.384	-4.410	-120
-110	-3.852	-3.881	-3.910	-3.939	-3.968	-3.997	-4.025	-4.053	-4.082	-4.110	-4.138	-110
-100	-3.553	-3.584	-3.614	-3.644	-3.674	-3.704	-3.734	-3.764	-3.793	-3.823	-3.852	-100
-90	-3.242	-3.274	-3.305	-3.337	-3.368	-3.399	-3.430	-3.461	-3.492	-3.523	-3.553	-90
-80	-2.920	-2.953	-2.985	-3.018	-3.050	-3.082	-3.115	-3.147	-3.179	-3.211	-3.242	-80
-70	-2.586	-2.620	-2.654	-2.687	-2.721	-2.754	-2.788	-2.821	-2.854	-2.887	-2.920	-70
-60	-2.243	-2.277	-2.312	-2.347	-2.381	-2.416	-2.450	-2.484	-2.518	-2.552	-2.586	-60
-50	-1.889	-1.925	-1.961	-1.996	-2.032	-2.067	-2.102	-2.137	-2.173	-2.208	-2.243	-50
-40	-1.527	-1.563	-1.600	-1.636	-1.673	-1.709	-1.745	-1.781	-1.817	-1.853	-1.889	-40
-30	-1.156	-1.193	-1.231	-1.268	-1.305	-1.342	-1.379	-1.416	-1.453	-1.490	-1.527	-30
-20	-0.777	-0.816	-0.854	-0.892	-0.930	-0.968	-1.005	-1.043	-1.081	-1.118	-1.156	-20
-10	-0.392	-0.431	-0.469	-0.508	-0.547	-0.585	-0.624	-0.662	-0.701	-0.739	-0.777	-10
= 0	0.000	-0.039	-0.079	-0.118	-0.157	-0.197	-0.236	-0.275	-0.314	-0.353	-0.392	= 0
0	0.000	0.039	0.079	0.119	0.158	0.198	0.238	0.277	0.317	0.357	0.397	0
10	0.397	0.437	0.477	0.517	0.557	0.597	0.637	0.677	0.718	0.758	0.798	10
20	0.798	0.838	0.879	0.919	0.960	1.000	1.041	1.081	1.122	1.162	1.203	20
30	1.203	1.244	1.285	1.325	1.366	1.407	1.448	1.489	1.529	1.570	1.611	30
40	1.611	1.652	1.693	1.734	1.776	1.817	1.858	1.899	1.940	1.981	2.022	40
50	2.022	2.064	2.105	2.146	2.188	2.229	2.270	2.312	2.353	2.394	2.436	50
60	2.436	2.477	2.519	2.560	2.601	2.643	2.684	2.726	2.767	2.809	2.850	60
70	2.850	2.892	2.933	2.975	3.016	3.058	3.100	3.141	3.183	3.224	3.266	70
80	3.266	3.307	3.349	3.390	3.432	3.473	3.515	3.556	3.598	3.639	3.681	80
90	3.681	3.722	3.764	3.805	3.847	3.888	3.930	3.971	4.012	4.054	4.095	90
100	4.095	4.137	4.178	4.219	4.261	4.302	4.343	4.384	4.426	4.467	4.508	100
110	4.508	4.549	4.590	4.632	4.673	4.714	4.755	4.796	4.837	4.878	4.919	110
120	4.919	4.960	5.001	5.042	5.083	5.124	5.164	5.205	5.246	5.287	5.327	120
130	5.327	5.368	5.409	5.450	5.490	5.531	5.571	5.612	5.652	5.693	5.733	130
140	5.733	5.774	5.814	5.855	5.895	5.936	5.976	6.016	6.057	6.097	6.137	140
150	6.137	6.177	6.218	6.258	6.298	6.338	6.378	6.419	6.459	6.499	6.539	150
160	6.539	6.579	6.619	6.659	6.699	6.739	6.779	6.819	6.859	6.899	6.939	160
170	6.939	6.979	7.019	7.059	7.099	7.139	7.179	7.219	7.259	7.299	7.338	170
180	7.338	7.378	7.418	7.458	7.498	7.538	7.578	7.618	7.658	7.697	7.737	180
190	7.737	7.777	7.817	7.857	7.897	7.937	7.977	8.017	8.057	8.097	8.137	190
200	8.137	8.177	8.216	8.256	8.296	8.336	8.376	8.416	8.456	8.497	8.537	200
210	8.537	8.577	8.617	8.657	8.697	8.737	8.777	8.817	8.857	8.898	8.938	210
220	8.938	8.978	9.018	9.058	9.099	9.139	9.179	9.220	9.260	9.300	9.341	220
230	9.341	9.381	9.421	9.462	9.502	9.543	9.583	9.624	9.664	9.705	9.745	230
240	9.745	9.786	9.826	9.867	9.907	9.948	9.989	10.029	10.070	10.111	10.151	240
250	10.151	10.192	10.233	10.274	10.315	10.355	10.396	10.437	10.478	10.519	10.560	250
260	10.560	10.600	10.641	10.682	10.723	10.764	10.805	10.846	10.887	10.928	10.969	260
270	10.969	11.010	11.051	11.093	11.134	11.175	11.216	11.257	11.298	11.339	11.381	270
280	11.381	11.422	11.463	11.504	11.546	11.587	11.628	11.669	11.711	11.752	11.793	280
290	11.793	11.835	11.876	11.918	11.959	12.000	12.042	12.083	12.125	12.166	12.207	290
300	12.207	12.249	12.290	12.332	12.373	12.415	12.456	12.498	12.539	12.581	12.623	300
310	12.623	12.664	12.706	12.747	12.789	12.831	12.872	12.914	12.955	12.997	13.039	310
320	13.039	13.080	13.122	13.164	13.205	13.247	13.289	13.331	13.372	13.414	13.456	320
330	13.456	13.497	13.539	13.581	13.623	13.665	13.706	13.748	13.790	13.832	13.874	330
340	13.874	13.915	13.957	13.999	14.041	14.083	14.125	14.167	14.208	14.250	14.292	340
DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C

TABLE 10 Type K Thermocouples Continued

Temperature in Degrees Celsius (IPTS 1968)

EMF in Absolute Millivolts

Reference Junctions at 0 C

DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
350	14.292	14.334	14.376	14.418	14.460	14.502	14.544	14.586	14.628	14.670	14.712	350
360	14.712	14.754	14.796	14.838	14.880	14.922	14.964	15.006	15.048	15.090	15.132	360
370	15.132	15.174	15.216	15.258	15.300	15.342	15.384	15.426	15.468	15.510	15.552	370
380	15.552	15.594	15.636	15.679	15.721	15.763	15.805	15.847	15.889	15.931	15.974	380
390	15.974	16.016	16.058	16.100	16.142	16.184	16.227	16.269	16.311	16.353	16.395	390
400	16.395	16.438	16.480	16.522	16.564	16.607	16.649	16.691	16.733	16.776	16.818	400
410	16.818	16.860	16.902	16.945	16.987	17.029	17.072	17.114	17.156	17.199	17.241	410
420	17.241	17.283	17.326	17.368	17.410	17.453	17.495	17.537	17.580	17.622	17.664	420
430	17.664	17.707	17.749	17.792	17.834	17.876	17.919	17.961	18.004	18.046	18.088	430
440	18.088	18.131	18.173	18.216	18.258	18.301	18.343	18.385	18.428	18.470	18.513	440
450	18.513	18.555	18.598	18.640	18.683	18.725	18.768	18.810	18.853	18.895	18.938	450
460	18.938	18.980	19.023	19.065	19.108	19.150	19.193	19.235	19.278	19.320	19.363	460
470	19.363	19.405	19.448	19.490	19.533	19.576	19.618	19.661	19.703	19.746	19.788	470
480	19.788	19.831	19.873	19.916	19.959	20.001	20.044	20.086	20.129	20.172	20.214	480
490	20.214	20.257	20.299	20.342	20.385	20.427	20.470	20.512	20.555	20.598	20.640	490
500	20.640	20.683	20.725	20.768	20.811	20.853	20.896	20.938	20.981	21.024	21.066	500
510	21.066	21.109	21.152	21.194	21.237	21.280	21.322	21.365	21.407	21.450	21.493	510
520	21.493	21.535	21.578	21.621	21.663	21.706	21.749	21.791	21.834	21.876	21.919	520
530	21.919	21.962	22.004	22.047	22.090	22.132	22.175	22.218	22.260	22.303	22.346	530
540	22.346	22.388	22.431	22.473	22.516	22.559	22.601	22.644	22.687	22.729	22.772	540
550	22.772	22.815	22.857	22.900	22.942	22.985	23.028	23.070	23.113	23.156	23.198	550
560	23.198	23.241	23.284	23.326	23.369	23.411	23.454	23.497	23.539	23.582	23.624	560
570	23.624	23.667	23.710	23.752	23.795	23.837	23.880	23.923	23.965	24.008	24.050	570
580	24.050	24.093	24.136	24.178	24.221	24.263	24.306	24.348	24.391	24.434	24.476	580
590	24.476	24.519	24.561	24.604	24.646	24.689	24.731	24.774	24.817	24.859	24.902	590
600	24.902	24.944	24.987	25.029	25.072	25.114	25.157	25.199	25.242	25.284	25.327	600
610	25.327	25.369	25.412	25.454	25.497	25.539	25.582	25.624	25.666	25.709	25.751	610
620	25.751	25.794	25.836	25.879	25.921	25.964	26.006	26.048	26.091	26.133	26.176	620
630	26.176	26.218	26.260	26.303	26.345	26.387	26.430	26.472	26.515	26.557	26.599	630
640	26.599	26.642	26.684	26.726	26.769	26.811	26.853	26.896	26.938	26.980	27.022	640
650	27.022	27.065	27.107	27.149	27.192	27.234	27.276	27.318	27.361	27.403	27.445	650
660	27.445	27.487	27.529	27.572	27.614	27.656	27.698	27.740	27.783	27.825	27.867	660
670	27.867	27.909	27.951	27.993	28.035	28.078	28.120	28.162	28.204	28.246	28.288	670
680	28.288	28.330	28.372	28.414	28.456	28.498	28.540	28.583	28.625	28.667	28.709	680
690	28.709	28.751	28.793	28.835	28.877	28.919	28.961	29.002	29.044	29.086	29.128	690
700	29.128	29.170	29.212	29.254	29.296	29.338	29.380	29.422	29.464	29.506	29.547	700
710	29.547	29.589	29.631	29.673	29.715	29.756	29.798	29.840	29.882	29.924	29.965	710
720	29.965	30.007	30.049	30.091	30.132	30.174	30.216	30.257	30.299	30.341	30.383	720
730	30.383	30.424	30.466	30.508	30.549	30.591	30.632	30.674	30.716	30.757	30.799	730
740	30.799	30.840	30.882	30.924	30.965	31.007	31.048	31.090	31.131	31.173	31.214	740
750	31.214	31.256	31.297	31.339	31.380	31.422	31.463	31.504	31.546	31.587	31.629	750
760	31.629	31.670	31.712	31.753	31.794	31.836	31.877	31.918	31.960	32.001	32.042	760
770	32.042	32.084	32.125	32.166	32.207	32.249	32.290	32.331	32.372	32.414	32.455	770
780	32.455	32.496	32.537	32.578	32.619	32.661	32.702	32.743	32.784	32.825	32.866	780
790	32.866	32.907	32.948	32.990	33.031	33.072	33.113	33.154	33.195	33.236	33.277	790
800	33.277	33.318	33.359	33.400	33.441	33.482	33.523	33.564	33.604	33.645	33.686	800
810	33.686	33.727	33.768	33.809	33.850	33.891	33.931	33.972	34.013	34.054	34.095	810
820	34.095	34.136	34.176	34.217	34.258	34.299	34.339	34.380	34.421	34.461	34.502	820
830	34.502	34.543	34.583	34.624	34.665	34.705	34.746	34.787	34.827	34.868	34.909	830
840	34.909	34.949	34.990	35.030	35.071	35.111	35.152	35.192	35.233	35.273	35.314	840
850	35.314	35.354	35.395	35.435	35.476	35.516	35.557	35.597	35.637	35.678	35.718	850
860	35.718	35.758	35.799	35.839	35.880	35.920	35.960	36.000	36.041	36.081	36.121	860
870	36.121	36.162	36.202	36.242	36.282	36.323	36.363	36.403	36.443	36.483	36.524	870
880	36.524	36.564	36.604	36.644	36.684	36.724	36.764	36.804	36.844	36.884	36.925	880
890	36.925	36.965	37.005	37.045	37.085	37.125	37.165	37.205	37.245	37.285	37.325	890
900	37.325	37.365	37.405	37.445	37.484	37.524	37.564	37.604	37.644	37.684	37.724	900
910	37.724	37.764	37.803	37.843	37.883	37.923	37.963	38.002	38.042	38.082	38.122	910
920	38.122	38.162	38.201	38.241	38.281	38.320	38.360	38.400	38.440	38.479	38.519	920
930	38.519	38.558	38.598	38.638	38.677	38.717	38.756	38.796	38.836	38.875	38.915	930
940	38.915	38.954	38.994	39.033	39.073	39.112	39.152	39.191	39.231	39.270	39.310	940
950	39.310	39.349	39.388	39.428	39.467	39.507	39.546	39.585	39.625	39.664	39.703	950
960	39.703	39.743	39.782	39.821	39.861	39.900	39.939	39.979	40.018	40.057	40.096	960
970	40.096	40.136	40.175	40.214	40.253	40.292	40.332	40.371	40.410	40.449	40.488	970
980	40.488	40.527	40.566	40.605	40.645	40.684	40.723	40.762	40.801	40.840	40.879	980
990	40.879	40.918	40.957	40.996	41.035	41.074	41.113	41.152	41.191	41.230	41.269	990

TABLE 10 Type K Thermocouples Continued
 Temperature in Degrees Celsius (IPTS 1968)

EMF in Absolute Millivolts

Reference Junctions at 0 C

DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
1.000	41.269	41.308	41.347	41.385	41.424	41.463	41.502	41.541	41.580	41.619	41.657	1.000
1.010	41.657	41.696	41.735	41.774	41.813	41.851	41.890	41.929	41.968	42.006	42.045	1.010
1.020	42.045	42.084	42.123	42.161	42.200	42.239	42.277	42.316	42.355	42.393	42.432	1.020
1.030	42.432	42.470	42.509	42.548	42.586	42.625	42.663	42.702	42.740	42.779	42.817	1.030
1.040	42.817	42.856	42.894	42.933	42.971	43.010	43.048	43.087	43.125	43.164	43.202	1.040
1.050	43.202	43.240	43.279	43.317	43.356	43.394	43.432	43.471	43.509	43.547	43.585	1.050
1.060	43.585	43.624	43.662	43.700	43.739	43.777	43.815	43.853	43.891	43.930	43.968	1.060
1.070	43.968	44.006	44.044	44.082	44.121	44.159	44.197	44.235	44.273	44.311	44.349	1.070
1.080	44.349	44.387	44.425	44.463	44.501	44.539	44.577	44.615	44.653	44.691	44.729	1.080
1.090	44.729	44.767	44.805	44.843	44.881	44.919	44.957	44.995	45.033	45.070	45.108	1.090
1.100	45.108	45.146	45.184	45.222	45.260	45.297	45.335	45.373	45.411	45.448	45.486	1.100
1.110	45.486	45.524	45.561	45.599	45.637	45.675	45.712	45.750	45.787	45.825	45.863	1.110
1.120	45.863	45.900	45.938	45.975	46.013	46.051	46.088	46.126	46.163	46.201	46.238	1.120
1.130	46.238	46.275	46.313	46.350	46.388	46.425	46.463	46.500	46.537	46.575	46.612	1.130
1.140	46.612	46.649	46.687	46.724	46.761	46.799	46.836	46.873	46.910	46.948	46.985	1.140
1.150	46.985	47.022	47.059	47.096	47.134	47.171	47.208	47.245	47.282	47.319	47.356	1.150
1.160	47.356	47.393	47.430	47.468	47.505	47.542	47.579	47.616	47.653	47.689	47.726	1.160
1.170	47.726	47.763	47.800	47.837	47.874	47.911	47.948	47.985	48.021	48.058	48.095	1.170
1.180	48.095	48.132	48.169	48.205	48.242	48.279	48.316	48.352	48.389	48.426	48.462	1.180
1.190	48.462	48.499	48.536	48.572	48.609	48.645	48.682	48.718	48.755	48.792	48.828	1.190
1.200	48.828	48.865	48.901	48.937	48.974	49.010	49.047	49.083	49.120	49.156	49.192	1.200
1.210	49.192	49.229	49.265	49.301	49.338	49.374	49.410	49.446	49.483	49.519	49.555	1.210
1.220	49.555	49.591	49.627	49.663	49.700	49.736	49.772	49.808	49.844	49.880	49.916	1.220
1.230	49.916	49.952	49.988	50.024	50.060	50.096	50.132	50.168	50.204	50.240	50.276	1.230
1.240	50.276	50.311	50.347	50.383	50.419	50.455	50.491	50.526	50.562	50.598	50.633	1.240
1.250	50.633	50.669	50.705	50.741	50.776	50.812	50.847	50.883	50.919	50.954	50.990	1.250
1.260	50.990	51.025	51.061	51.096	51.132	51.167	51.203	51.238	51.274	51.309	51.344	1.260
1.270	51.344	51.380	51.415	51.450	51.486	51.521	51.556	51.592	51.627	51.662	51.697	1.270
1.280	51.697	51.733	51.768	51.803	51.838	51.873	51.908	51.943	51.979	52.014	52.049	1.280
1.290	52.049	52.084	52.119	52.154	52.189	52.224	52.259	52.294	52.329	52.364	52.398	1.290
1.300	52.398	52.433	52.468	52.503	52.538	52.573	52.608	52.642	52.677	52.712	52.747	1.300
1.310	52.747	52.781	52.816	52.851	52.886	52.920	52.955	52.989	53.024	53.059	53.093	1.310
1.320	53.093	53.128	53.162	53.197	53.232	53.266	53.301	53.335	53.370	53.404	53.439	1.320
1.330	53.439	53.473	53.507	53.542	53.576	53.611	53.645	53.679	53.714	53.748	53.782	1.330
1.340	53.782	53.817	53.851	53.885	53.920	53.954	53.988	54.022	54.057	54.091	54.125	1.340
1.350	54.125	54.159	54.193	54.228	54.262	54.296	54.330	54.364	54.398	54.432	54.466	1.350
1.360	54.466	54.501	54.535	54.569	54.603	54.637	54.671	54.705	54.739	54.773	54.807	1.360
1.370	54.807	54.841	54.875									1.370
DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C

TABLE 11 Type R Thermocouples
Temperature in Degrees Fahrenheit*

EMF in Absolute Millivolts

Reference Junctions at 32 F

DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
-50	-0.210	-0.212	-0.214	-0.216	-0.218	-0.220	-0.222	-0.224	-0.226			-50
-40	-0.188	-0.190	-0.192	-0.194	-0.197	-0.199	-0.201	-0.203	-0.205	-0.207	-0.210	-40
-30	-0.165	-0.167	-0.169	-0.172	-0.174	-0.176	-0.179	-0.181	-0.183	-0.185	-0.188	-30
-20	-0.141	-0.143	-0.145	-0.148	-0.150	-0.153	-0.155	-0.158	-0.160	-0.162	-0.165	-20
-10	-0.116	-0.118	-0.121	-0.123	-0.126	-0.128	-0.131	-0.133	-0.136	-0.138	-0.141	-10
-0	-0.089	-0.092	-0.095	-0.097	-0.100	-0.103	-0.105	-0.108	-0.110	-0.113	-0.116	-0
0	-0.089	-0.087	-0.084	-0.082	-0.079	-0.076	-0.073	-0.071	-0.068	-0.065	-0.063	0
10	-0.063	-0.060	-0.057	-0.054	-0.051	-0.049	-0.046	-0.043	-0.040	-0.037	-0.035	10
20	-0.035	-0.032	-0.029	-0.026	-0.023	-0.020	-0.017	-0.015	-0.012	-0.009	-0.006	20
30	-0.006	-0.003	0.000	0.003	0.006	0.009	0.012	0.015	0.018	0.021	0.024	30
40	0.024	0.027	0.030	0.033	0.036	0.039	0.042	0.045	0.048	0.051	0.054	40
50	0.054	0.057	0.060	0.064	0.067	0.070	0.073	0.076	0.079	0.082	0.086	50
60	0.086	0.089	0.092	0.095	0.098	0.101	0.105	0.108	0.111	0.114	0.118	60
70	0.118	0.121	0.124	0.127	0.131	0.134	0.137	0.141	0.144	0.147	0.150	70
80	0.150	0.154	0.157	0.161	0.164	0.167	0.171	0.174	0.177	0.181	0.184	80
90	0.184	0.188	0.191	0.194	0.198	0.201	0.205	0.208	0.212	0.215	0.218	90
100	0.218	0.222	0.225	0.229	0.232	0.236	0.239	0.243	0.246	0.250	0.253	100
110	0.253	0.257	0.261	0.264	0.268	0.271	0.275	0.278	0.282	0.286	0.289	110
120	0.289	0.293	0.296	0.300	0.304	0.307	0.311	0.315	0.318	0.322	0.326	120
130	0.326	0.329	0.333	0.337	0.340	0.344	0.348	0.351	0.355	0.359	0.363	130
140	0.363	0.366	0.370	0.374	0.378	0.381	0.385	0.389	0.393	0.397	0.400	140
150	0.400	0.404	0.408	0.412	0.416	0.419	0.423	0.427	0.431	0.435	0.439	150
160	0.439	0.443	0.446	0.450	0.454	0.458	0.462	0.466	0.470	0.474	0.478	160
170	0.478	0.482	0.485	0.489	0.493	0.497	0.501	0.505	0.509	0.513	0.517	170
180	0.517	0.521	0.525	0.529	0.533	0.537	0.541	0.545	0.549	0.553	0.557	180
190	0.557	0.561	0.565	0.569	0.573	0.577	0.581	0.586	0.590	0.594	0.598	190
200	0.598	0.602	0.606	0.610	0.614	0.618	0.622	0.627	0.631	0.635	0.639	200
210	0.639	0.643	0.647	0.651	0.656	0.660	0.664	0.668	0.672	0.676	0.681	210
220	0.681	0.685	0.689	0.693	0.697	0.702	0.706	0.710	0.714	0.719	0.723	220
230	0.723	0.727	0.731	0.736	0.740	0.744	0.748	0.753	0.757	0.761	0.766	230
240	0.766	0.770	0.774	0.778	0.783	0.787	0.791	0.796	0.800	0.804	0.809	240
250	0.809	0.813	0.817	0.822	0.826	0.830	0.835	0.839	0.844	0.848	0.852	250
260	0.852	0.857	0.861	0.866	0.870	0.874	0.879	0.883	0.888	0.892	0.897	260
270	0.897	0.901	0.905	0.910	0.914	0.919	0.923	0.928	0.932	0.937	0.941	270
280	0.941	0.946	0.950	0.955	0.959	0.964	0.968	0.973	0.977	0.982	0.986	280
290	0.986	0.991	0.995	1.000	1.004	1.009	1.013	1.018	1.022	1.027	1.032	290
300	1.032	1.036	1.041	1.045	1.050	1.054	1.059	1.064	1.068	1.073	1.077	300
310	1.077	1.082	1.087	1.091	1.096	1.101	1.105	1.110	1.114	1.119	1.124	310
320	1.124	1.128	1.133	1.138	1.142	1.147	1.152	1.156	1.161	1.166	1.170	320
330	1.170	1.175	1.180	1.184	1.189	1.194	1.199	1.203	1.208	1.213	1.217	330
340	1.217	1.222	1.227	1.232	1.236	1.241	1.246	1.251	1.255	1.260	1.265	340
350	1.265	1.270	1.274	1.279	1.284	1.289	1.294	1.298	1.303	1.308	1.313	350
360	1.313	1.318	1.322	1.327	1.332	1.337	1.342	1.346	1.351	1.356	1.361	360
370	1.361	1.366	1.371	1.375	1.380	1.385	1.390	1.395	1.400	1.405	1.409	370
380	1.409	1.414	1.419	1.424	1.429	1.434	1.439	1.444	1.449	1.453	1.458	380
390	1.458	1.463	1.468	1.473	1.478	1.483	1.488	1.493	1.498	1.503	1.508	390
400	1.508	1.512	1.517	1.522	1.527	1.532	1.537	1.542	1.547	1.552	1.557	400
410	1.557	1.562	1.567	1.572	1.577	1.582	1.587	1.592	1.597	1.602	1.607	410
420	1.607	1.612	1.617	1.622	1.627	1.632	1.637	1.642	1.647	1.652	1.657	420
430	1.657	1.662	1.667	1.672	1.677	1.682	1.687	1.692	1.698	1.703	1.708	430
440	1.708	1.713	1.718	1.723	1.728	1.733	1.738	1.743	1.748	1.753	1.758	440
450	1.758	1.764	1.769	1.774	1.779	1.784	1.789	1.794	1.799	1.804	1.810	450
460	1.810	1.815	1.820	1.825	1.830	1.835	1.840	1.845	1.851	1.856	1.861	460
470	1.861	1.866	1.871	1.876	1.882	1.887	1.892	1.897	1.902	1.907	1.913	470
480	1.913	1.918	1.923	1.928	1.933	1.938	1.944	1.949	1.954	1.959	1.964	480
490	1.964	1.970	1.975	1.980	1.985	1.991	1.996	2.001	2.006	2.011	2.017	490
500	2.017	2.022	2.027	2.032	2.038	2.043	2.048	2.053	2.059	2.064	2.069	500
510	2.069	2.074	2.080	2.085	2.090	2.095	2.101	2.106	2.111	2.117	2.122	510
520	2.122	2.127	2.132	2.138	2.143	2.148	2.154	2.159	2.164	2.170	2.175	520
530	2.175	2.180	2.186	2.191	2.196	2.201	2.207	2.212	2.217	2.223	2.228	530
540	2.228	2.233	2.239	2.244	2.249	2.255	2.260	2.266	2.271	2.276	2.282	540
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F

* Converted from degrees Celsius (IPTS 1968).

TABLE 11 Type R Thermocouples Continued

Temperature in Degrees Fahrenheit^a

EMF in Absolute Millivolts

Reference Junctions at 32 F

DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
550	2.282	2.287	2.292	2.298	2.303	2.308	2.314	2.319	2.325	2.330	2.335	550
560	2.335	2.341	2.346	2.351	2.357	2.362	2.368	2.373	2.378	2.384	2.389	560
570	2.389	2.395	2.400	2.405	2.411	2.416	2.422	2.427	2.433	2.438	2.443	570
580	2.443	2.449	2.454	2.460	2.465	2.471	2.476	2.481	2.487	2.492	2.498	580
590	2.498	2.503	2.509	2.514	2.520	2.525	2.531	2.536	2.541	2.547	2.552	590
600	2.552	2.558	2.563	2.569	2.574	2.580	2.585	2.591	2.596	2.602	2.607	600
610	2.607	2.613	2.618	2.624	2.629	2.635	2.640	2.646	2.651	2.657	2.662	610
620	2.662	2.668	2.673	2.679	2.684	2.690	2.695	2.701	2.706	2.712	2.718	620
630	2.718	2.723	2.729	2.734	2.740	2.745	2.751	2.756	2.762	2.767	2.773	630
640	2.773	2.779	2.784	2.790	2.795	2.801	2.806	2.812	2.818	2.823	2.829	640
650	2.829	2.834	2.840	2.845	2.851	2.857	2.862	2.868	2.873	2.879	2.885	650
660	2.885	2.890	2.896	2.901	2.907	2.913	2.918	2.924	2.929	2.935	2.941	660
670	2.941	2.946	2.952	2.957	2.963	2.969	2.974	2.980	2.986	2.991	2.997	670
680	2.997	3.002	3.008	3.014	3.019	3.025	3.031	3.036	3.042	3.048	3.053	680
690	3.053	3.059	3.065	3.070	3.076	3.082	3.087	3.093	3.099	3.104	3.110	690
700	3.110	3.116	3.121	3.127	3.133	3.138	3.144	3.150	3.155	3.161	3.167	700
710	3.167	3.172	3.178	3.184	3.189	3.195	3.201	3.207	3.212	3.218	3.224	710
720	3.224	3.229	3.235	3.241	3.247	3.252	3.258	3.264	3.269	3.275	3.281	720
730	3.281	3.287	3.292	3.298	3.304	3.309	3.315	3.321	3.327	3.332	3.338	730
740	3.338	3.344	3.350	3.355	3.361	3.367	3.373	3.378	3.384	3.390	3.396	740
750	3.396	3.401	3.407	3.413	3.419	3.424	3.430	3.436	3.442	3.448	3.453	750
760	3.453	3.459	3.465	3.471	3.476	3.482	3.488	3.494	3.500	3.505	3.511	760
770	3.511	3.517	3.523	3.529	3.534	3.540	3.546	3.552	3.558	3.563	3.569	770
780	3.569	3.575	3.581	3.587	3.592	3.598	3.604	3.610	3.616	3.622	3.627	780
790	3.627	3.633	3.639	3.645	3.651	3.657	3.662	3.668	3.674	3.680	3.686	790
800	3.686	3.692	3.697	3.703	3.709	3.715	3.721	3.727	3.733	3.738	3.744	800
810	3.744	3.750	3.756	3.762	3.768	3.774	3.779	3.785	3.791	3.797	3.803	810
820	3.803	3.809	3.815	3.821	3.826	3.832	3.838	3.844	3.850	3.856	3.862	820
830	3.862	3.868	3.874	3.879	3.885	3.891	3.897	3.903	3.909	3.915	3.921	830
840	3.921	3.927	3.933	3.938	3.944	3.950	3.956	3.962	3.968	3.974	3.980	840
850	3.980	3.986	3.992	3.998	4.004	4.009	4.015	4.021	4.027	4.033	4.039	850
860	4.039	4.045	4.051	4.057	4.063	4.069	4.075	4.081	4.087	4.093	4.099	860
870	4.099	4.105	4.110	4.116	4.122	4.128	4.134	4.140	4.146	4.152	4.158	870
880	4.158	4.164	4.170	4.176	4.182	4.188	4.194	4.200	4.206	4.212	4.218	880
890	4.218	4.224	4.230	4.236	4.242	4.248	4.254	4.260	4.266	4.272	4.278	890
900	4.278	4.284	4.290	4.296	4.302	4.308	4.314	4.320	4.326	4.332	4.338	900
910	4.338	4.344	4.350	4.356	4.362	4.368	4.374	4.380	4.386	4.392	4.398	910
920	4.398	4.404	4.410	4.416	4.422	4.428	4.434	4.440	4.446	4.452	4.458	920
930	4.458	4.464	4.471	4.477	4.483	4.489	4.495	4.501	4.507	4.513	4.519	930
940	4.519	4.525	4.531	4.537	4.543	4.549	4.555	4.561	4.567	4.574	4.580	940
950	4.580	4.586	4.592	4.598	4.604	4.610	4.616	4.622	4.628	4.634	4.640	950
960	4.640	4.647	4.653	4.659	4.665	4.671	4.677	4.683	4.689	4.695	4.701	960
970	4.701	4.707	4.714	4.720	4.726	4.732	4.738	4.744	4.750	4.756	4.762	970
980	4.762	4.769	4.775	4.781	4.787	4.793	4.799	4.805	4.811	4.818	4.824	980
990	4.824	4.830	4.836	4.842	4.848	4.854	4.860	4.867	4.873	4.879	4.885	990
1000	4.885	4.891	4.897	4.904	4.910	4.916	4.922	4.928	4.934	4.940	4.947	1000
1010	4.947	4.953	4.959	4.965	4.971	4.977	4.984	4.990	4.996	5.002	5.008	1010
1020	5.008	5.014	5.021	5.027	5.033	5.039	5.045	5.052	5.058	5.064	5.070	1020
1030	5.070	5.076	5.082	5.089	5.095	5.101	5.107	5.113	5.120	5.126	5.132	1030
1040	5.132	5.138	5.144	5.151	5.157	5.163	5.169	5.175	5.182	5.188	5.194	1040
1050	5.194	5.200	5.207	5.213	5.219	5.225	5.231	5.238	5.244	5.250	5.256	1050
1060	5.256	5.263	5.269	5.275	5.281	5.288	5.294	5.300	5.306	5.313	5.319	1060
1070	5.319	5.325	5.331	5.337	5.344	5.350	5.356	5.362	5.369	5.375	5.381	1070
1080	5.381	5.388	5.394	5.400	5.406	5.413	5.419	5.425	5.431	5.438	5.444	1080
1090	5.444	5.450	5.456	5.463	5.469	5.475	5.482	5.488	5.494	5.500	5.507	1090
1100	5.507	5.513	5.519	5.526	5.532	5.538	5.544	5.551	5.557	5.563	5.570	1100
1110	5.570	5.576	5.582	5.589	5.595	5.601	5.607	5.614	5.620	5.626	5.633	1110
1120	5.633	5.639	5.645	5.652	5.658	5.664	5.671	5.677	5.683	5.690	5.696	1120
1130	5.696	5.702	5.709	5.715	5.721	5.728	5.734	5.740	5.747	5.753	5.759	1130
1140	5.759	5.766	5.772	5.778	5.785	5.791	5.797	5.804	5.810	5.816	5.823	1140
1150	5.823	5.829	5.835	5.842	5.848	5.855	5.861	5.867	5.874	5.880	5.886	1150
1160	5.886	5.893	5.899	5.905	5.912	5.918	5.925	5.931	5.937	5.944	5.950	1160
1170	5.950	5.957	5.963	5.969	5.976	5.982	5.988	5.995	6.001	6.008	6.014	1170
1180	6.014	6.021	6.027	6.033	6.040	6.046	6.053	6.059	6.065	6.072	6.078	1180
1190	6.078	6.085	6.091	6.098	6.104	6.110	6.117	6.123	6.130	6.136	6.143	1190

Converted from degrees Celsius (IPTS 1988).

TABLE 11 Type R Thermocouples Continued
Temperature in Degrees Fahrenheit*

EMF in Absolute Millivolts

Reference Junctions at 32 F

DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
1200	6.143	6.149	6.155	6.162	6.168	6.175	6.181	6.188	6.194	6.201	6.207	1200
1210	6.207	6.213	6.220	6.226	6.233	6.239	6.246	6.252	6.259	6.265	6.272	1210
1220	6.272	6.278	6.285	6.291	6.297	6.304	6.310	6.317	6.323	6.330	6.336	1220
1230	6.336	6.343	6.349	6.356	6.362	6.369	6.375	6.382	6.388	6.395	6.401	1230
1240	6.401	6.408	6.414	6.421	6.427	6.434	6.440	6.447	6.453	6.460	6.466	1240
1250	6.466	6.473	6.479	6.486	6.492	6.499	6.505	6.512	6.518	6.525	6.532	1250
1260	6.532	6.538	6.545	6.551	6.558	6.564	6.571	6.577	6.584	6.590	6.597	1260
1270	6.597	6.603	6.610	6.616	6.623	6.630	6.636	6.643	6.649	6.656	6.662	1270
1280	6.662	6.669	6.675	6.682	6.689	6.695	6.702	6.708	6.715	6.721	6.728	1280
1290	6.728	6.735	6.741	6.748	6.754	6.761	6.767	6.774	6.781	6.787	6.794	1290
1300	6.794	6.800	6.807	6.814	6.820	6.827	6.833	6.840	6.847	6.853	6.860	1300
1310	6.860	6.866	6.873	6.880	6.886	6.893	6.899	6.906	6.913	6.919	6.926	1310
1320	6.926	6.932	6.939	6.946	6.952	6.959	6.966	6.972	6.979	6.985	6.992	1320
1330	6.992	6.999	7.005	7.012	7.019	7.025	7.032	7.039	7.045	7.052	7.059	1330
1340	7.059	7.065	7.072	7.078	7.085	7.092	7.098	7.105	7.112	7.118	7.125	1340
1350	7.125	7.132	7.138	7.145	7.152	7.158	7.165	7.172	7.178	7.185	7.192	1350
1360	7.192	7.198	7.205	7.212	7.218	7.225	7.232	7.239	7.245	7.252	7.259	1360
1370	7.259	7.265	7.272	7.279	7.285	7.292	7.299	7.305	7.312	7.319	7.326	1370
1380	7.326	7.332	7.339	7.346	7.352	7.359	7.366	7.373	7.379	7.386	7.393	1380
1390	7.393	7.399	7.406	7.413	7.420	7.426	7.433	7.440	7.447	7.453	7.460	1390
1400	7.460	7.467	7.474	7.480	7.487	7.494	7.500	7.507	7.514	7.521	7.527	1400
1410	7.527	7.534	7.541	7.548	7.554	7.561	7.568	7.575	7.582	7.588	7.595	1410
1420	7.595	7.602	7.609	7.615	7.622	7.629	7.636	7.642	7.649	7.656	7.663	1420
1430	7.663	7.670	7.676	7.683	7.690	7.697	7.703	7.710	7.717	7.724	7.731	1430
1440	7.731	7.737	7.744	7.751	7.758	7.765	7.771	7.778	7.785	7.792	7.799	1440
1450	7.799	7.805	7.812	7.819	7.826	7.833	7.840	7.846	7.853	7.860	7.867	1450
1460	7.867	7.874	7.880	7.887	7.894	7.901	7.908	7.915	7.921	7.928	7.935	1460
1470	7.935	7.942	7.949	7.956	7.963	7.969	7.976	7.983	7.990	7.997	8.004	1470
1480	8.004	8.010	8.017	8.024	8.031	8.038	8.045	8.052	8.058	8.065	8.072	1480
1490	8.072	8.079	8.086	8.093	8.100	8.107	8.113	8.120	8.127	8.134	8.141	1490
1500	8.141	8.148	8.155	8.162	8.168	8.175	8.182	8.189	8.196	8.203	8.210	1500
1510	8.210	8.217	8.224	8.231	8.237	8.244	8.251	8.258	8.265	8.272	8.279	1510
1520	8.279	8.286	8.293	8.300	8.306	8.313	8.320	8.327	8.334	8.341	8.348	1520
1530	8.348	8.355	8.362	8.369	8.376	8.383	8.390	8.397	8.403	8.410	8.417	1530
1540	8.417	8.424	8.431	8.438	8.445	8.452	8.459	8.466	8.473	8.480	8.487	1540
1550	8.487	8.494	8.501	8.508	8.515	8.522	8.529	8.535	8.542	8.549	8.556	1550
1560	8.556	8.563	8.570	8.577	8.584	8.591	8.598	8.605	8.612	8.619	8.626	1560
1570	8.626	8.633	8.640	8.647	8.654	8.661	8.668	8.675	8.682	8.689	8.696	1570
1580	8.696	8.703	8.710	8.717	8.724	8.731	8.738	8.745	8.752	8.759	8.766	1580
1590	8.766	8.773	8.780	8.787	8.794	8.801	8.808	8.815	8.822	8.829	8.836	1590
1600	8.836	8.843	8.850	8.857	8.864	8.871	8.878	8.885	8.892	8.899	8.907	1600
1610	8.907	8.914	8.921	8.928	8.935	8.942	8.949	8.956	8.963	8.970	8.977	1610
1620	8.977	8.984	8.991	8.998	9.005	9.012	9.019	9.026	9.033	9.040	9.048	1620
1630	9.048	9.055	9.062	9.069	9.076	9.083	9.090	9.097	9.104	9.111	9.118	1630
1640	9.118	9.125	9.132	9.140	9.147	9.154	9.161	9.168	9.175	9.182	9.189	1640
1650	9.189	9.196	9.203	9.210	9.218	9.225	9.232	9.239	9.246	9.253	9.260	1650
1660	9.260	9.267	9.274	9.282	9.289	9.296	9.303	9.310	9.317	9.324	9.331	1660
1670	9.331	9.338	9.346	9.353	9.360	9.367	9.374	9.381	9.388	9.395	9.403	1670
1680	9.403	9.410	9.417	9.424	9.431	9.438	9.445	9.453	9.460	9.467	9.474	1680
1690	9.474	9.481	9.488	9.495	9.503	9.510	9.517	9.524	9.531	9.538	9.546	1690
1700	9.546	9.553	9.560	9.567	9.574	9.581	9.589	9.596	9.603	9.610	9.617	1700
1710	9.617	9.624	9.632	9.639	9.646	9.653	9.660	9.668	9.675	9.682	9.689	1710
1720	9.689	9.696	9.704	9.711	9.718	9.725	9.732	9.740	9.747	9.754	9.761	1720
1730	9.761	9.768	9.776	9.783	9.790	9.797	9.804	9.812	9.819	9.826	9.833	1730
1740	9.833	9.840	9.848	9.855	9.862	9.869	9.877	9.884	9.891	9.898	9.906	1740
1750	9.906	9.913	9.920	9.927	9.934	9.942	9.949	9.956	9.963	9.971	9.978	1750
1760	9.978	9.985	9.992	10.000	10.007	10.014	10.021	10.029	10.036	10.043	10.050	1760
1770	10.050	10.058	10.065	10.072	10.079	10.087	10.094	10.101	10.109	10.116	10.123	1770
1780	10.123	10.130	10.138	10.145	10.152	10.159	10.167	10.174	10.181	10.189	10.196	1780
1790	10.196	10.203	10.210	10.218	10.225	10.232	10.240	10.247	10.254	10.262	10.269	1790
1800	10.269	10.276	10.283	10.291	10.298	10.305	10.313	10.320	10.327	10.335	10.342	1800
1810	10.342	10.349	10.357	10.364	10.371	10.379	10.386	10.393	10.400	10.408	10.415	1810
1820	10.415	10.422	10.430	10.437	10.444	10.452	10.459	10.466	10.474	10.481	10.488	1820
1830	10.488	10.496	10.503	10.511	10.518	10.525	10.533	10.540	10.547	10.555	10.562	1830
1840	10.562	10.569	10.577	10.584	10.591	10.599	10.606	10.613	10.621	10.628	10.636	1840
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F

* Converted from degrees Celsius (IPTS 1968)

TABLE 11 Tyoe R Thermocouples Continued

Temperature in Degrees Fahrenheit*

EMF in Absolute Millivolts

Reference Junctions at 32 F

DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
1.850	10.636	10.643	10.650	10.658	10.665	10.672	10.680	10.687	10.695	10.702	10.709	1.850
1.860	10.709	10.717	10.724	10.731	10.739	10.746	10.754	10.761	10.768	10.776	10.783	1.860
1.870	10.783	10.791	10.798	10.805	10.813	10.820	10.828	10.835	10.842	10.850	10.857	1.870
1.880	10.857	10.865	10.872	10.879	10.887	10.894	10.902	10.909	10.917	10.924	10.931	1.880
1.890	10.931	10.939	10.946	10.954	10.961	10.968	10.976	10.983	10.991	10.998	11.006	1.890
1.900	11.006	11.013	11.021	11.028	11.035	11.043	11.050	11.058	11.065	11.073	11.080	1.900
1.910	11.080	11.088	11.095	11.102	11.110	11.117	11.125	11.132	11.140	11.147	11.155	1.910
1.920	11.155	11.162	11.170	11.177	11.184	11.192	11.199	11.207	11.214	11.222	11.229	1.920
1.930	11.229	11.237	11.244	11.252	11.259	11.267	11.274	11.282	11.289	11.297	11.304	1.930
1.940	11.304	11.312	11.319	11.327	11.334	11.342	11.349	11.357	11.364	11.372	11.379	1.940
1.950	11.379	11.387	11.394	11.402	11.409	11.417	11.424	11.432	11.439	11.447	11.454	1.950
1.960	11.454	11.462	11.469	11.477	11.484	11.492	11.499	11.507	11.514	11.522	11.529	1.960
1.970	11.529	11.537	11.544	11.552	11.559	11.567	11.574	11.582	11.590	11.597	11.605	1.970
1.980	11.605	11.612	11.620	11.627	11.635	11.642	11.650	11.657	11.665	11.672	11.680	1.980
1.990	11.680	11.688	11.695	11.703	11.710	11.718	11.725	11.733	11.740	11.748	11.756	1.990
2.000	11.756	11.763	11.771	11.778	11.786	11.793	11.801	11.808	11.816	11.824	11.831	2.000
2.010	11.831	11.839	11.846	11.854	11.861	11.869	11.877	11.884	11.892	11.899	11.907	2.010
2.020	11.907	11.914	11.922	11.930	11.937	11.945	11.952	11.960	11.968	11.975	11.983	2.020
2.030	11.983	11.990	11.998	12.005	12.013	12.021	12.028	12.036	12.043	12.051	12.059	2.030
2.040	12.059	12.066	12.074	12.081	12.089	12.097	12.104	12.112	12.119	12.127	12.135	2.040
2.050	12.135	12.142	12.150	12.157	12.165	12.173	12.180	12.188	12.196	12.203	12.211	2.050
2.060	12.211	12.218	12.226	12.234	12.241	12.249	12.257	12.264	12.272	12.279	12.287	2.060
2.070	12.287	12.295	12.302	12.310	12.318	12.325	12.333	12.340	12.348	12.356	12.363	2.070
2.080	12.363	12.371	12.379	12.386	12.394	12.402	12.409	12.417	12.424	12.432	12.440	2.080
2.090	12.440	12.447	12.455	12.463	12.470	12.478	12.486	12.493	12.501	12.509	12.516	2.090
2.100	12.516	12.524	12.532	12.539	12.547	12.555	12.562	12.570	12.577	12.585	12.593	2.100
2.110	12.593	12.600	12.608	12.616	12.623	12.631	12.639	12.646	12.654	12.662	12.669	2.110
2.120	12.669	12.677	12.685	12.693	12.700	12.708	12.716	12.723	12.731	12.739	12.746	2.120
2.130	12.746	12.754	12.762	12.769	12.777	12.785	12.792	12.800	12.808	12.815	12.823	2.130
2.140	12.823	12.831	12.838	12.846	12.854	12.862	12.869	12.877	12.885	12.892	12.900	2.140
2.150	12.900	12.908	12.915	12.923	12.931	12.938	12.946	12.954	12.962	12.969	12.977	2.150
2.160	12.977	12.985	12.992	13.000	13.008	13.016	13.023	13.031	13.039	13.046	13.054	2.160
2.170	13.054	13.062	13.069	13.077	13.085	13.093	13.100	13.108	13.116	13.123	13.131	2.170
2.180	13.131	13.139	13.147	13.154	13.162	13.170	13.178	13.185	13.193	13.201	13.208	2.180
2.190	13.208	13.216	13.224	13.232	13.239	13.247	13.255	13.263	13.270	13.278	13.286	2.190
2.200	13.286	13.293	13.301	13.309	13.317	13.324	13.332	13.340	13.348	13.355	13.363	2.200
2.210	13.363	13.371	13.379	13.386	13.394	13.402	13.409	13.417	13.425	13.433	13.440	2.210
2.220	13.440	13.448	13.456	13.464	13.471	13.479	13.487	13.495	13.502	13.510	13.518	2.220
2.230	13.518	13.526	13.533	13.541	13.549	13.557	13.564	13.572	13.580	13.588	13.595	2.230
2.240	13.595	13.603	13.611	13.619	13.627	13.634	13.642	13.650	13.658	13.665	13.673	2.240
2.250	13.673	13.681	13.689	13.696	13.704	13.712	13.720	13.727	13.735	13.743	13.751	2.250
2.260	13.751	13.759	13.766	13.774	13.782	13.790	13.797	13.805	13.813	13.821	13.828	2.260
2.270	13.828	13.836	13.844	13.852	13.860	13.867	13.875	13.883	13.891	13.898	13.906	2.270
2.280	13.906	13.914	13.922	13.930	13.937	13.945	13.953	13.961	13.968	13.976	13.984	2.280
2.290	13.984	13.992	14.000	14.007	14.015	14.023	14.031	14.039	14.046	14.054	14.062	2.290
2.300	14.062	14.070	14.078	14.085	14.093	14.101	14.109	14.116	14.124	14.132	14.140	2.300
2.310	14.140	14.148	14.155	14.163	14.171	14.179	14.187	14.194	14.202	14.210	14.218	2.310
2.320	14.218	14.226	14.233	14.241	14.249	14.257	14.265	14.272	14.280	14.288	14.296	2.320
2.330	14.296	14.304	14.311	14.319	14.327	14.335	14.343	14.350	14.358	14.366	14.374	2.330
2.340	14.374	14.382	14.389	14.397	14.405	14.413	14.421	14.429	14.436	14.444	14.452	2.340
2.350	14.452	14.460	14.468	14.475	14.483	14.491	14.499	14.507	14.514	14.522	14.530	2.350
2.360	14.530	14.538	14.546	14.554	14.561	14.569	14.577	14.585	14.593	14.600	14.608	2.360
2.370	14.608	14.616	14.624	14.632	14.640	14.647	14.655	14.663	14.671	14.679	14.686	2.370
2.380	14.686	14.694	14.702	14.710	14.718	14.726	14.733	14.741	14.749	14.757	14.765	2.380
2.390	14.765	14.772	14.780	14.788	14.796	14.804	14.812	14.819	14.827	14.835	14.843	2.390
2.400	14.843	14.851	14.859	14.866	14.874	14.882	14.890	14.898	14.906	14.913	14.921	2.400
2.410	14.921	14.929	14.937	14.945	14.953	14.960	14.968	14.976	14.984	14.992	15.000	2.410
2.420	15.000	15.007	15.015	15.023	15.031	15.039	15.047	15.054	15.062	15.070	15.078	2.420
2.430	15.078	15.086	15.094	15.101	15.109	15.117	15.125	15.133	15.141	15.148	15.156	2.430
2.440	15.156	15.164	15.172	15.180	15.188	15.195	15.203	15.211	15.219	15.227	15.235	2.440
2.450	15.235	15.242	15.250	15.258	15.266	15.274	15.282	15.289	15.297	15.305	15.313	2.450
2.460	15.313	15.321	15.329	15.337	15.344	15.352	15.360	15.368	15.376	15.384	15.391	2.460
2.470	15.391	15.399	15.407	15.415	15.423	15.431	15.438	15.446	15.454	15.462	15.470	2.470
2.480	15.470	15.478	15.486	15.493	15.501	15.509	15.517	15.525	15.533	15.540	15.548	2.480
2.490	15.548	15.556	15.564	15.572	15.580	15.587	15.595	15.603	15.611	15.619	15.627	2.490

* Converted from degrees Celsius (IPTS 1968).

TABLE 11 Type R Thermocouples Continued
Temperature in Degrees Fahrenheit*

EMF in Absolute Millivolts

Reference Junctions at 32 F

DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
2,500	15.627	15.635	15.642	15.650	15.658	15.666	15.674	15.682	15.689	15.697	15.705	2,500
2,510	15.705	15.713	15.721	15.729	15.737	15.744	15.752	15.760	15.768	15.776	15.784	2,510
2,520	15.784	15.791	15.799	15.807	15.815	15.823	15.831	15.839	15.846	15.854	15.862	2,520
2,530	15.862	15.870	15.878	15.886	15.893	15.901	15.909	15.917	15.925	15.933	15.941	2,530
2,540	15.941	15.948	15.956	15.964	15.972	15.980	15.988	15.995	16.003	16.011	16.019	2,540
2,550	16.019	16.027	16.035	16.043	16.050	16.058	16.066	16.074	16.082	16.090	16.097	2,550
2,560	16.097	16.105	16.113	16.121	16.129	16.137	16.145	16.152	16.160	16.168	16.176	2,560
2,570	16.176	16.184	16.192	16.199	16.207	16.215	16.223	16.231	16.239	16.247	16.254	2,570
2,580	16.254	16.262	16.270	16.278	16.286	16.294	16.301	16.309	16.317	16.325	16.333	2,580
2,590	16.333	16.341	16.349	16.356	16.364	16.372	16.380	16.388	16.396	16.403	16.411	2,590
2,600	16.411	16.419	16.427	16.435	16.443	16.450	16.458	16.466	16.474	16.482	16.490	2,600
2,610	16.490	16.498	16.505	16.513	16.521	16.529	16.537	16.545	16.552	16.560	16.568	2,610
2,620	16.568	16.576	16.584	16.592	16.599	16.607	16.615	16.623	16.631	16.639	16.646	2,620
2,630	16.646	16.654	16.662	16.670	16.678	16.686	16.694	16.701	16.709	16.717	16.725	2,630
2,640	16.725	16.733	16.741	16.748	16.756	16.764	16.772	16.780	16.788	16.795	16.803	2,640
2,650	16.803	16.811	16.819	16.827	16.835	16.842	16.850	16.858	16.866	16.874	16.882	2,650
2,660	16.882	16.889	16.897	16.905	16.913	16.921	16.929	16.936	16.944	16.952	16.960	2,660
2,670	16.960	16.968	16.976	16.983	16.991	16.999	17.007	17.015	17.022	17.030	17.038	2,670
2,680	17.038	17.046	17.054	17.062	17.069	17.077	17.085	17.093	17.101	17.109	17.116	2,680
2,690	17.116	17.124	17.132	17.140	17.148	17.156	17.163	17.171	17.179	17.187	17.195	2,690
2,700	17.195	17.202	17.210	17.218	17.226	17.234	17.242	17.249	17.257	17.265	17.273	2,700
2,710	17.273	17.281	17.288	17.296	17.304	17.312	17.320	17.328	17.335	17.343	17.351	2,710
2,720	17.351	17.359	17.367	17.374	17.382	17.390	17.398	17.406	17.413	17.421	17.429	2,720
2,730	17.429	17.437	17.445	17.453	17.460	17.468	17.476	17.484	17.492	17.499	17.507	2,730
2,740	17.507	17.515	17.523	17.531	17.538	17.546	17.554	17.562	17.570	17.577	17.585	2,740
2,750	17.585	17.593	17.601	17.609	17.616	17.624	17.632	17.640	17.648	17.655	17.663	2,750
2,760	17.663	17.671	17.679	17.687	17.694	17.702	17.710	17.718	17.726	17.733	17.741	2,760
2,770	17.741	17.749	17.757	17.765	17.772	17.780	17.788	17.796	17.804	17.811	17.819	2,770
2,780	17.819	17.827	17.835	17.842	17.850	17.858	17.866	17.874	17.881	17.889	17.897	2,780
2,790	17.897	17.905	17.913	17.920	17.928	17.936	17.944	17.951	17.959	17.967	17.975	2,790
2,800	17.975	17.983	17.990	17.998	18.006	18.014	18.021	18.029	18.037	18.045	18.053	2,800
2,810	18.053	18.060	18.068	18.076	18.084	18.091	18.099	18.107	18.115	18.123	18.130	2,810
2,820	18.130	18.138	18.146	18.154	18.161	18.169	18.177	18.185	18.192	18.200	18.208	2,820
2,830	18.208	18.216	18.223	18.231	18.239	18.247	18.255	18.262	18.270	18.278	18.286	2,830
2,840	18.286	18.293	18.301	18.309	18.317	18.324	18.332	18.340	18.348	18.355	18.363	2,840
2,850	18.363	18.371	18.379	18.386	18.394	18.402	18.410	18.417	18.425	18.433	18.441	2,850
2,860	18.441	18.448	18.456	18.464	18.472	18.479	18.487	18.495	18.502	18.510	18.518	2,860
2,870	18.518	18.526	18.533	18.541	18.549	18.557	18.564	18.572	18.580	18.588	18.595	2,870
2,880	18.595	18.603	18.611	18.619	18.626	18.634	18.642	18.649	18.657	18.665	18.673	2,880
2,890	18.673	18.680	18.688	18.696	18.703	18.711	18.719	18.727	18.734	18.742	18.750	2,890
2,900	18.750	18.758	18.765	18.773	18.781	18.788	18.796	18.804	18.812	18.819	18.827	2,900
2,910	18.827	18.835	18.842	18.850	18.858	18.865	18.873	18.881	18.889	18.896	18.904	2,910
2,920	18.904	18.912	18.919	18.927	18.935	18.943	18.950	18.958	18.966	18.973	18.981	2,920
2,930	18.981	18.989	18.996	19.004	19.012	19.019	19.027	19.035	19.043	19.050	19.058	2,930
2,940	19.058	19.066	19.073	19.081	19.089	19.096	19.104	19.112	19.119	19.127	19.135	2,940
2,950	19.135	19.142	19.150	19.158	19.165	19.173	19.181	19.188	19.196	19.204	19.211	2,950
2,960	19.211	19.219	19.227	19.234	19.242	19.250	19.257	19.265	19.273	19.280	19.288	2,960
2,970	19.288	19.296	19.303	19.311	19.319	19.326	19.334	19.342	19.349	19.357	19.365	2,970
2,980	19.365	19.372	19.380	19.388	19.395	19.403	19.411	19.418	19.426	19.434	19.441	2,980
2,990	19.441	19.449	19.457	19.464	19.472	19.479	19.487	19.495	19.502	19.510	19.518	2,990
3,000	19.518	19.525	19.533	19.541	19.548	19.556	19.563	19.571	19.579	19.586	19.594	3,000
3,010	19.594	19.602	19.609	19.617	19.624	19.632	19.640	19.647	19.655	19.663	19.670	3,010
3,020	19.670	19.678	19.685	19.693	19.701	19.708	19.716	19.723	19.731	19.739	19.746	3,020
3,030	19.746	19.754	19.761	19.769	19.777	19.784	19.792	19.800	19.807	19.815	19.822	3,030
3,040	19.822	19.830	19.837	19.845	19.853	19.860	19.868	19.875	19.883	19.891	19.898	3,040
3,050	19.898	19.906	19.913	19.921	19.929	19.936	19.944	19.951	19.959	19.966	19.974	3,050
3,060	19.974	19.982	19.989	19.997	20.004	20.012	20.019	20.027	20.034	20.042	20.050	3,060
3,070	20.050	20.057	20.065	20.072	20.080	20.087	20.095	20.102	20.110	20.117	20.125	3,070
3,080	20.125	20.132	20.140	20.148	20.155	20.163	20.170	20.178	20.185	20.193	20.200	3,080
3,090	20.200	20.208	20.215	20.223	20.230	20.238	20.245	20.253	20.260	20.268	20.275	3,090
3,100	20.275	20.283	20.290	20.297	20.305	20.312	20.320	20.327	20.335	20.342	20.350	3,100
3,110	20.350	20.357	20.365	20.372	20.380	20.387	20.394	20.402	20.409	20.417	20.424	3,110
3,120	20.424	20.432	20.439	20.446	20.454	20.461	20.469	20.476	20.483	20.491	20.498	3,120
3,130	20.498	20.506	20.513	20.520	20.528	20.535	20.543	20.550	20.557	20.565	20.572	3,130
3,140	20.572	20.579	20.587	20.594	20.601	20.609	20.616	20.623	20.631	20.638	20.645	3,140
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F

* Converted from degrees Celsius (IPTS 1968).

TABLE 11 Type R Thermocouples Continued
Temperature in Degrees Fahrenheit*

EMF in Absolute Millivolts											Reference Junctions at 32 F	
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
3,150	20.645	20.653	20.660	20.667	20.675	20.682	20.689	20.697	20.704	20.711	20.718	3,150
3,160	20.718	20.726	20.733	20.740	20.748	20.755	20.762	20.769	20.777	20.784	20.791	3,160
3,170	20.791	20.798	20.806	20.813	20.820	20.827	20.834	20.842	20.849	20.856	20.863	3,170
3,180	20.863	20.870	20.878	20.885	20.892	20.899	20.906	20.914	20.921	20.928	20.935	3,180
3,190	20.935	20.942	20.949	20.956	20.964	20.971	20.978	20.985	20.992	20.999	21.006	3,190
3,200	21.006	21.013	21.021	21.028	21.035	21.042	21.049	21.056	21.063	21.070	21.077	3,200
3,210	21.077	21.084	21.091	21.098	21.105							3,210
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F

* Converted from degrees Celsius (ITS 1968).

TABLE 12 Type R Thermocouples
Temperature in Degrees Celsius (IPTS 1968)

EMF in Absolute Millivolts

Reference Junctions at 0°C

DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
-50	-0.226											-50
-40	-0.188	-0.192	-0.196	-0.200	-0.204	-0.207	-0.211	-0.215	-0.219	-0.223	-0.226	-40
-30	-0.145	-0.150	-0.154	-0.158	-0.163	-0.167	-0.171	-0.175	-0.180	-0.184	-0.188	-30
-20	-0.100	-0.105	-0.109	-0.114	-0.119	-0.123	-0.128	-0.132	-0.137	-0.141	-0.145	-20
-10	-0.051	-0.056	-0.061	-0.066	-0.071	-0.076	-0.081	-0.086	-0.091	-0.095	-0.100	-10
0	0.000	-0.005	-0.011	-0.016	-0.021	-0.026	-0.031	-0.036	-0.041	-0.046	-0.051	0
0	0.000	0.005	0.011	0.016	0.021	0.027	0.032	0.038	0.043	0.049	0.054	0
10	0.054	0.060	0.065	0.071	0.077	0.082	0.088	0.094	0.100	0.105	0.111	10
20	0.111	0.117	0.123	0.129	0.135	0.141	0.147	0.152	0.158	0.165	0.171	20
30	0.171	0.177	0.183	0.189	0.195	0.201	0.207	0.214	0.220	0.226	0.232	30
40	0.232	0.239	0.245	0.251	0.258	0.264	0.271	0.277	0.283	0.290	0.296	40
50	0.296	0.303	0.310	0.316	0.323	0.329	0.336	0.343	0.349	0.356	0.363	50
60	0.363	0.369	0.376	0.383	0.390	0.397	0.403	0.410	0.417	0.424	0.431	60
70	0.431	0.438	0.445	0.452	0.459	0.466	0.473	0.480	0.487	0.494	0.501	70
80	0.501	0.508	0.515	0.523	0.530	0.537	0.544	0.552	0.559	0.566	0.573	80
90	0.573	0.581	0.588	0.595	0.603	0.610	0.617	0.625	0.632	0.640	0.647	90
100	0.647	0.655	0.662	0.670	0.677	0.685	0.692	0.700	0.708	0.715	0.723	100
110	0.723	0.730	0.738	0.746	0.754	0.761	0.769	0.777	0.784	0.792	0.800	110
120	0.800	0.808	0.816	0.824	0.831	0.839	0.847	0.855	0.863	0.871	0.879	120
130	0.879	0.887	0.895	0.903	0.911	0.919	0.927	0.935	0.943	0.951	0.959	130
140	0.959	0.967	0.975	0.983	0.992	1.000	1.008	1.016	1.024	1.032	1.041	140
150	1.041	1.049	1.057	1.065	1.074	1.082	1.090	1.099	1.107	1.115	1.124	150
160	1.124	1.132	1.140	1.149	1.157	1.166	1.174	1.183	1.191	1.200	1.208	160
170	1.208	1.217	1.225	1.234	1.242	1.251	1.259	1.268	1.276	1.285	1.294	170
180	1.294	1.302	1.311	1.319	1.328	1.337	1.345	1.354	1.363	1.372	1.380	180
190	1.380	1.389	1.398	1.407	1.415	1.424	1.433	1.442	1.450	1.459	1.468	190
200	1.468	1.477	1.486	1.495	1.504	1.512	1.521	1.530	1.539	1.548	1.557	200
210	1.557	1.566	1.575	1.584	1.593	1.602	1.611	1.620	1.629	1.638	1.647	210
220	1.647	1.656	1.665	1.674	1.683	1.692	1.702	1.711	1.720	1.729	1.738	220
230	1.738	1.747	1.756	1.766	1.775	1.784	1.793	1.802	1.812	1.821	1.830	230
240	1.830	1.839	1.849	1.858	1.867	1.876	1.886	1.895	1.904	1.914	1.923	240
250	1.923	1.932	1.942	1.951	1.960	1.970	1.979	1.988	1.998	2.007	2.017	250
260	2.017	2.026	2.036	2.045	2.054	2.064	2.073	2.083	2.092	2.102	2.111	260
270	2.111	2.121	2.130	2.140	2.149	2.159	2.169	2.178	2.188	2.197	2.207	270
280	2.207	2.216	2.226	2.236	2.245	2.255	2.264	2.274	2.284	2.293	2.303	280
290	2.303	2.313	2.322	2.332	2.342	2.351	2.361	2.371	2.381	2.390	2.400	290
300	2.400	2.410	2.420	2.429	2.439	2.449	2.459	2.468	2.478	2.488	2.498	300
310	2.498	2.508	2.517	2.527	2.537	2.547	2.557	2.567	2.577	2.586	2.596	310
320	2.596	2.606	2.616	2.626	2.636	2.646	2.656	2.666	2.676	2.685	2.695	320
330	2.695	2.705	2.715	2.725	2.735	2.745	2.755	2.765	2.775	2.785	2.795	330
340	2.795	2.805	2.815	2.825	2.835	2.845	2.855	2.866	2.876	2.886	2.896	340
350	2.896	2.906	2.916	2.926	2.936	2.946	2.956	2.966	2.977	2.987	2.997	350
360	2.997	3.007	3.017	3.027	3.037	3.048	3.058	3.068	3.078	3.088	3.099	360
370	3.099	3.109	3.119	3.129	3.139	3.150	3.160	3.170	3.180	3.191	3.201	370
380	3.201	3.211	3.221	3.232	3.242	3.252	3.263	3.273	3.283	3.293	3.304	380
390	3.304	3.314	3.324	3.335	3.345	3.355	3.366	3.376	3.386	3.397	3.407	390
400	3.407	3.418	3.428	3.438	3.449	3.459	3.470	3.480	3.490	3.501	3.511	400
410	3.511	3.522	3.532	3.543	3.553	3.563	3.574	3.584	3.595	3.605	3.616	410
420	3.616	3.626	3.637	3.647	3.658	3.668	3.679	3.689	3.700	3.710	3.721	420
430	3.721	3.731	3.742	3.752	3.763	3.774	3.784	3.795	3.805	3.816	3.826	430
440	3.826	3.837	3.848	3.858	3.869	3.879	3.890	3.901	3.911	3.922	3.933	440
450	3.933	3.943	3.954	3.964	3.975	3.986	3.996	4.007	4.018	4.028	4.039	450
460	4.039	4.050	4.061	4.071	4.082	4.093	4.103	4.114	4.125	4.136	4.146	460
470	4.146	4.157	4.168	4.178	4.189	4.200	4.211	4.222	4.232	4.243	4.254	470
480	4.254	4.265	4.275	4.286	4.297	4.308	4.319	4.329	4.340	4.351	4.362	480
490	4.362	4.373	4.384	4.394	4.405	4.416	4.427	4.438	4.449	4.460	4.471	490
500	4.471	4.481	4.492	4.503	4.514	4.525	4.536	4.547	4.558	4.569	4.580	500
510	4.580	4.591	4.601	4.612	4.623	4.634	4.645	4.656	4.667	4.678	4.689	510
520	4.689	4.700	4.711	4.722	4.733	4.744	4.755	4.766	4.777	4.788	4.799	520
530	4.799	4.810	4.821	4.832	4.843	4.854	4.865	4.876	4.888	4.899	4.910	530
540	4.910	4.921	4.932	4.943	4.954	4.965	4.976	4.987	4.998	5.009	5.021	540
550	5.021	5.032	5.043	5.054	5.065	5.076	5.087	5.099	5.110	5.121	5.132	550
560	5.132	5.143	5.154	5.166	5.177	5.188	5.199	5.210	5.221	5.233	5.244	560
570	5.244	5.255	5.266	5.278	5.289	5.300	5.311	5.322	5.334	5.345	5.356	570
580	5.356	5.368	5.379	5.390	5.401	5.413	5.424	5.435	5.446	5.458	5.469	580
590	5.469	5.480	5.492	5.503	5.514	5.526	5.537	5.548	5.560	5.571	5.582	590

DEG C 0 1 2 3 4 5 6 7 8 9 10 DEG C

TABLE 12 Type R Thermocouples Continued
 Temperature in Degrees Celsius (IPTS 1968)

F in Absolute Millivolts

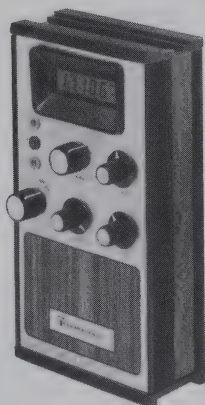
Reference Junctions at 0 C

C	0	1	2	3	4	5	6	7	8	9	10	DEG C
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
00	5.582	5.594	5.605	5.616	5.628	5.639	5.650	5.662	5.673	5.685	5.696	600
10	5.696	5.707	5.719	5.730	5.742	5.753	5.764	5.776	5.787	5.799	5.810	610
20	5.810	5.821	5.833	5.844	5.856	5.867	5.879	5.890	5.902	5.913	5.925	620
30	5.925	5.936	5.948	5.959	5.971	5.982	5.994	6.005	6.017	6.028	6.040	630
40	6.040	6.051	6.063	6.074	6.086	6.098	6.109	6.121	6.132	6.144	6.155	640
50	6.155	6.167	6.179	6.190	6.202	6.213	6.225	6.237	6.248	6.260	6.272	650
60	6.272	6.283	6.295	6.307	6.318	6.330	6.342	6.353	6.365	6.377	6.388	660
70	6.388	6.400	6.412	6.423	6.435	6.447	6.458	6.470	6.482	6.494	6.505	670
80	6.505	6.517	6.529	6.541	6.552	6.564	6.576	6.588	6.599	6.611	6.623	680
90	6.623	6.635	6.647	6.658	6.670	6.682	6.694	6.706	6.718	6.729	6.741	690
00	6.741	6.753	6.765	6.777	6.789	6.800	6.812	6.824	6.836	6.848	6.860	700
10	6.860	6.872	6.884	6.895	6.907	6.919	6.931	6.943	6.955	6.967	6.979	710
20	6.979	6.991	7.003	7.015	7.027	7.039	7.051	7.063	7.074	7.086	7.098	720
30	7.098	7.110	7.122	7.134	7.146	7.158	7.170	7.182	7.194	7.206	7.218	730
40	7.218	7.231	7.243	7.255	7.267	7.279	7.291	7.303	7.315	7.327	7.339	740
50	7.339	7.351	7.363	7.375	7.387	7.399	7.412	7.424	7.436	7.448	7.460	750
60	7.460	7.472	7.484	7.496	7.509	7.521	7.533	7.545	7.557	7.569	7.582	760
70	7.582	7.594	7.606	7.618	7.630	7.642	7.655	7.667	7.679	7.691	7.703	770
80	7.703	7.716	7.728	7.740	7.752	7.765	7.777	7.789	7.801	7.814	7.826	780
90	7.826	7.838	7.850	7.863	7.875	7.887	7.900	7.912	7.924	7.937	7.949	790
00	7.949	7.961	7.973	7.986	7.998	8.010	8.023	8.035	8.047	8.060	8.072	800
10	8.072	8.085	8.097	8.109	8.122	8.134	8.146	8.159	8.171	8.184	8.196	810
20	8.196	8.208	8.221	8.233	8.246	8.258	8.271	8.283	8.295	8.308	8.320	820
30	8.320	8.333	8.345	8.358	8.370	8.383	8.395	8.408	8.420	8.433	8.445	830
40	8.445	8.458	8.470	8.483	8.495	8.508	8.520	8.533	8.545	8.558	8.570	840
50	8.570	8.583	8.595	8.608	8.621	8.633	8.646	8.658	8.671	8.683	8.696	850
60	8.696	8.709	8.721	8.734	8.746	8.759	8.772	8.784	8.797	8.810	8.822	860
70	8.822	8.835	8.847	8.860	8.873	8.885	8.898	8.911	8.923	8.936	8.949	870
80	8.949	8.961	8.974	8.987	9.000	9.012	9.025	9.038	9.050	9.063	9.076	880
90	9.076	9.089	9.101	9.114	9.127	9.140	9.152	9.165	9.178	9.191	9.203	890
00	9.203	9.216	9.229	9.242	9.254	9.267	9.280	9.293	9.306	9.319	9.331	900
10	9.331	9.344	9.357	9.370	9.383	9.395	9.408	9.421	9.434	9.447	9.460	910
20	9.460	9.473	9.485	9.498	9.511	9.524	9.537	9.550	9.563	9.576	9.589	920
30	9.589	9.602	9.614	9.627	9.640	9.653	9.666	9.679	9.692	9.705	9.718	930
40	9.718	9.731	9.744	9.757	9.770	9.783	9.796	9.809	9.822	9.835	9.848	940
50	9.848	9.861	9.874	9.887	9.900	9.913	9.926	9.939	9.952	9.965	9.978	950
60	9.978	9.991	10.004	10.017	10.030	10.043	10.056	10.069	10.082	10.095	10.109	960
70	10.109	10.122	10.135	10.148	10.161	10.174	10.187	10.200	10.213	10.227	10.240	970
80	10.240	10.253	10.266	10.279	10.292	10.305	10.319	10.332	10.345	10.358	10.371	980
90	10.371	10.384	10.398	10.411	10.424	10.437	10.450	10.464	10.477	10.490	10.503	990
00	10.503	10.516	10.530	10.543	10.556	10.569	10.583	10.596	10.609	10.622	10.636	1.000
10	10.636	10.649	10.662	10.675	10.688	10.702	10.715	10.729	10.742	10.755	10.768	1.010
20	10.768	10.782	10.795	10.808	10.822	10.835	10.848	10.862	10.875	10.888	10.902	1.020
30	10.902	10.915	10.928	10.942	10.955	10.968	10.982	10.995	11.009	11.022	11.035	1.030
40	11.035	11.049	11.062	11.076	11.089	11.102	11.116	11.129	11.143	11.156	11.170	1.040
50	11.170	11.183	11.196	11.210	11.223	11.237	11.250	11.264	11.277	11.291	11.304	1.050
60	11.304	11.318	11.331	11.345	11.358	11.372	11.385	11.399	11.412	11.426	11.439	1.060
70	11.439	11.453	11.466	11.480	11.493	11.507	11.520	11.534	11.547	11.561	11.574	1.070
80	11.574	11.588	11.602	11.615	11.629	11.642	11.656	11.669	11.683	11.697	11.710	1.080
90	11.710	11.724	11.737	11.751	11.765	11.778	11.792	11.805	11.819	11.833	11.846	1.090
00	11.846	11.860	11.874	11.887	11.901	11.914	11.928	11.942	11.955	11.969	11.983	1.100
10	11.983	11.996	12.010	12.024	12.037	12.051	12.065	12.078	12.092	12.106	12.119	1.110
20	12.119	12.133	12.147	12.161	12.174	12.188	12.202	12.215	12.229	12.243	12.257	1.120
30	12.257	12.270	12.284	12.298	12.311	12.325	12.339	12.353	12.366	12.380	12.394	1.130
40	12.394	12.408	12.421	12.435	12.449	12.463	12.476	12.490	12.504	12.518	12.532	1.140
50	12.532	12.545	12.559	12.573	12.587	12.600	12.614	12.628	12.642	12.656	12.669	1.150
60	12.669	12.683	12.697	12.711	12.725	12.739	12.752	12.766	12.780	12.794	12.808	1.160
70	12.808	12.822	12.835	12.849	12.863	12.877	12.891	12.905	12.918	12.932	12.946	1.170
80	12.946	12.960	12.974	12.988	13.002	13.016	13.029	13.043	13.057	13.071	13.085	1.180
90	13.085	13.099	13.113	13.127	13.140	13.154	13.168	13.182	13.196	13.210	13.224	1.190
00	13.224	13.238	13.252	13.266	13.280	13.293	13.307	13.321	13.335	13.349	13.363	1.200
10	13.363	13.377	13.391	13.405	13.419	13.433	13.447	13.461	13.475	13.489	13.502	1.210
20	13.502	13.516	13.530	13.544	13.558	13.572	13.586	13.600	13.614	13.628	13.642	1.220
30	13.642	13.656	13.670	13.684	13.698	13.712	13.726	13.740	13.754	13.768	13.782	1.230
40	13.782	13.796	13.810	13.824	13.838	13.852	13.866	13.880	13.894	13.908	13.922	1.240
C	0	1	2	3	4	5	6	7	8	9	10	DEG C

Frequency Generator and Counter

Model 1070

- Generator & Counter in One Hand-Held Instrument
- 0.1 Hz Resolution
- 0.005% F. S. Accuracy
- Low Frequency: 10 Hz
- Snap-Pack® Battery Cartridge Powered



The Transmation Model 1070 Frequency Generator and Counter is a hand-held, battery-powered instrument that can measure or generate frequency signals. In addition to frequency measurement capabilities to 0.1 Hz resolution, the Model 1070 provides frequency outputs of sine, square and triangle waveforms from 10.0 to 100 KHz in three switch-selectable ranges.

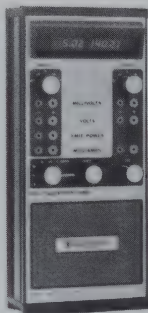
SPECIFICATIONS:

Ranges:

Input:	10.0-1999.9 Hz	0.010-19.999 kHz	1.00-199.99 kHz
Output:	10.0-1000.0 Hz	0.100-10.000 kHz	1.00-100.00 kHz
Resolution:	0.1 Hz	1 Hz	10 Hz
Gate Time:	0.1 sec		

Input Sensitivity:	10 mV p-p; -3 dB @ 50 kHz
Maximum Input Voltage:	150V p-p
Output Waveform:	Sine, triangle, square
Output Amplitude:	15V p-p max. into 1K ohm or greater load, adjustable
Sine Wave Distortion:	1% typical
Triangle Wave Linearity:	0.1% typical
Square Wave Duty Cycle:	50% ±1%
Output Impedance:	70 ohms
Signal to Noise Ratio:	60 dB minimum
Accuracy:	±5 PPM of reading ±½ LSD; ±0.005% of F.S.
Display:	4½-digit LCD
Operating Temperature:	0°C to 49°C (32°F to 120°F)
Temperature Effect:	Less than 1 PPM/°C
Power Supply:	Snap-Pack® Battery Cartridge, AC or DC
Battery Life:	250 hours maximum-measurement mode; 6 hours minimum-continuous output
Dimensions (HWD):	210 mm x 114 mm x 70 mm (8.25" x 4.5" x 2.75")
Weight:	2.1 kg (4.5 lb.)

Contact Transmation, Inc. for additional information.



- **Dual Display Provides Simultaneous Monitoring of Input & Output Signals**
- **Percent (%) Output Switch Positions: 0, 25, 50, 75, 100 and 0% of Span**
- **High Accuracy: $\pm 0.02\%$ F.S. on Millivolt Ranges**
- **Snap-Pack® Battery Cartridge Powered**

The Transmation Model 1080 FlexiTESTER® is a field-portable, microcomputer-based digital calibrator and signal indicator with the capability to simultaneously measure and generate DC signals within a millivolt, voltage or current range, and to simultaneously indicate these values on dual displays without switching.

SPECIFICATIONS:
Input Ranges:

RANGE	IMPEDANCE	RESOLUTION	ACCURACY
-150 to +150 mV	10 Megohms	0.007% F.S.	$\pm 0.013\%$ F.S. $\pm 0.020\%$ of reading
-75 to +75 V	1 Megohm	0.013% F.S.	$\pm 0.013\%$ F.S. $\pm 0.040\%$ of reading
-75 to +75 mA	10 ohms	0.013% F.S.	$\pm 0.026\%$ F.S. $\pm 0.053\%$ of reading

Output Ranges:

RANGE	OUTPUT DRIVE CAPABILITY	RESOLUTION	ACCURACY
0 to 150 mV	1 mA max.	0.007% F.S.	$\pm 0.013\%$ F.S. $\pm 0.013\%$ of reading
0 to 24V	80 mA max.	0.042% F.S.	$\pm 0.042\%$ F.S. $\pm 0.128\%$ of reading
0 to 60 mA	1200 ohms @ 20 mA DC max. 400 ohms @ 60 mA DC max.	0.017% F.S.	$\pm 0.033\%$ F.S. $\pm 0.053\%$ of reading
XMIT SIM 0 to 60 mA	Dependent upon loop supply		

24 VDC isolated unregulated loop power supply; 60 mA max.

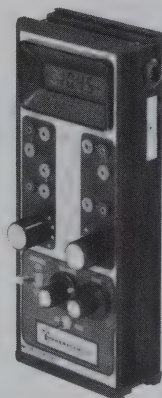
Output Impedance:	Millivolt and voltage ranges: 0.5 ohms
Repeatability:	2 LSD
Stability:	$\pm 0.005\%$ of span for 24 hours; $\pm 0.01\%$ of span for 30 days
Power Supply:	Snap-Pack® Battery Cartridge, AC or DC
Charge Life:	5 hours continuous in measurement mode, reduced by 1 hour/20 mA of current drawn by load
Battery Life:	1000 charge/discharge cycles
Warm-Up Time:	30 seconds or less to rated accuracy
Operating Time:	0°C to 60°C (32°F to 140°F)
Temperature Effect:	$\pm 0.0025\%$ of span/°C
Display:	Two 6-digit fluorescent displays readable from 5 feet
Dimensions (HWD):	241 mm x 114 mm x 54 mm (9.5" x 4.5" x 2.1")
Weight:	1.8 kg (4 lb.)

Contact Transmation, Inc. for additional information.

Personal Calibrator

Model 1045

- Simultaneous Input & Output Functions
- $\pm 0.02\%$ of Full Scale Input Accuracy
- mA, mV, Voltage Ranges
- Full-Featured, Low Cost
- Power Calibrator and Charge Batteries Simultaneously



The Transmation Model 1045 Personal Calibrator is a field-portable, battery-powered precision test instrument that provides 90% of the most commonly used calibration capabilities in a package one-fifth the size and one-quarter the price of bulky shop calibrators. It generates calibration signals with the highest accuracy yet achieved in a portable field-service device, along with many of the capabilities of a DVM, yet is affordable enough to be standard equipment in every tool kit.

SPECIFICATIONS:

	RANGE	IMPEDANCE	ACCURACY	
Input	-99.99 to +99.99 mVDC	10 Megohms		
Ranges:	-9.999 to +9.999 VDC	1 Megohm	$\pm 0.01\%$ F.S. $\pm 0.01\%$ of reading ± 1 LSD	
	-99.99 to +99.99 VDC	1 Megohm		
	-99.99 to +99.99 mADC	10 ohms $\pm 5\%$		
Output	0 to 99.99 mVDC	0.5 ohms	$\pm 0.01\%$ F.S.	$\pm 0.01\%$ of reading ± 1 LSD
Ranges:	0 to 9.999 VDC	2.0 ohms		
	0 to 22 mADC	500 ohm load	$\pm 0.045\%$ F.S.	

Current Limiting: All outputs are current limited to 27 mADC
Resolution: $\pm 9.999\text{V}$ input & $0-9.999\text{V}$ output ranges: 0.001 VDC
 Other ranges: 0.01 mA, mV or VDC

Repeatability: 1 LSD

Stability: 1 LSD for 24 hours; 2 LSD for 30 days

Power Supply: Four AA rechargeable nickel-cadmium batteries

Charge Life: All input modes, mV and V output: 16 hours, nominal
 4 mA continuous output: 12 hours
 20 mA continuous output: 4 hours

Operating Temperature: 0°C to 50°C (32°F to 122°F)

Ambient Temperature

Effect: $\pm 0.01\%$ of span/ $^{\circ}\text{C}$

Display: 4-digit LCD

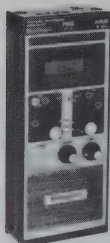
Dimensions (HWD): 216 mm x 86 mm x 42 mm (8.55" x 3.38" x 1.65")

Weight: 0.9 kg (1.75 lb.)

Contact Transmation, Inc. for additional information.

Pressure FlexiTESTER®

Model 1090



- **Total Loop Maintenance:**
Pressure, Current, Voltage
- **Quick-Connect Multirange Pressure Modules**
- **NBS-Traceable Accuracy: 0.1% F.S., Resolution to 0.001 psig**
- **Positive Overpressure Protection**
- **System**
- **Snap-Pack® Battery Cartridge Powered**

The Model 1090 Pressure FlexiTESTER® is a hand-held, battery-powered precision test instrument designed to perform field pressure loop calibration plus measure and generate DC process signals. The Model 1090 consists of three distinct modules: the Readout Module, the Transducer Module and the Snap-Pack® Battery Cartridge. This tri-module concept, an industry exclusive, provides a quick and convenient means of changing pressure measurement capabilities while maintaining high accuracy in a field-portable instrument.

SPECIFICATIONS:

Pressure

Input

Ranges:

BASIC TRANSDUCER MODULE RANGE (psig)	ACCURACY*	RESOLUTION (psig)	NOMINAL RELIEF VALVE PRESSURE (psig)
0.000 to 5.000	0.005	0.001	5.3
0.000 to 10.000	0.010	0.001	10.5
0.000 to 16.000	0.016	0.001	16.7
0.00 to 33.00	0.03	0.01	34.5
0.00 to 50.00	0.05	0.01	52.4
0.00 to 100.00	0.10	0.01	104.5

Other ranges (e.g. inches water, kPa, mm water, kgf/cm², mm Hg) are available in ranges equivalent to the basic range.

*Represents combined accuracy of Model 1090 and Transducer Module.

Current & Voltage Ranges:

Input:

RANGE	IMPEDANCE	ACCURACY
-50 to +50V	1 Megohm	+0.01V + 1 LSD
-50 to +50 mA	10 ohms	+0.01 mA + 1 LSD

Output:

0 to 11V	0.5 ohms	+0.01V + 1 LSD
0 to 22 mA	Drive Capability: 500 ohms max. @20 mA	+0.01 mA + 1 LSD
Transmitter Simulate: 0 to 22 mA	Drive Capability: dependent upon loop power supply (12-65 VDC)	+0.01 mA + 1 LSD

24 VDC typical @ 20 mA for powering two-wire devices

Stability:

±1 LSD for 24 hrs.; ±2 LSD for 30 days

Operating Temperature:

0°C to 49°C (-22°F to 140°F)

Power:

Snap-Pack® Battery Cartridge, AC or DC

Charge Life:

Voltage, current or pressure inputs: 25 hrs. typical
20 mA output or 24V power @ 20 mA: 9 hrs. typical

Display:

4 ½-digit LCD with status annunciators

Dimensions (HWD):

273 mm x 114 mm x 55 mm (10.75" x 4.5" x 2.18")

Weight:

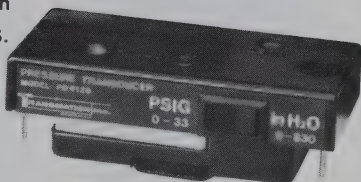
1.9 kg (4.1 lb.) including module and Snap-Pack® cartridge

Contact Transmation, Inc. for additional information.

Pressure Transducer Modules

Used with Model 1090

- Positive Overpressure Protection
System Preserves Module Calibration
- NBS-Traceable Accuracy: 0.07% F.S.
- Auto-Zero Correction; Filtered Ports
- Measures Pressure and Differential Pressure
- Numerous Ranges to Meet Any Requirement



The Transmation Pressure Transducer Module is the heart of the innovative modular approach of the Model 1090 Pressure FlexiTESTER®. Each Transducer Module is designed to mount directly on top of a Model 1090, permitting quick and economical pressure range changes. Modules are available in single scale and switch-selectable dual scale versions that provide a Model 1090 display of pressure values in actual engineering units: psig, inches of water, kPa, mm of water, kgf/cm² or mm of Hg.

SPECIFICATIONS:

Input Ranges:	See Model 1090 on facing page
Module Accuracy:	±0.07% of Full Scale
Auto-Zero:	Pushbutton reset to zero ± 1 count
Connectors:	Threaded internal 1/8"-27 NPT fittings
Media Compatibility:	Non-conductive, non-corrosive instrument-grade clean air or clean inert gas
Repeatability, Sensitivity:	Combined: 1 LSD on display
Dimensions (HWD):	38 mm x 114 mm x 55 mm (1.5" x 4.5" x 2.2")
Weight:	0.5 kg (1.08 lb.)



Contact Transmation, Inc. for additional information concerning available modules and scales.

Precision Pressure Pump**Model 1098P**

- Portable Air Supply: -2 to 200 psig
- 0.001 psig Resolution
- One-Handed Operation; Functions at Any Angle
- Dual Output Ports Permit Simultaneous Connection to 2 Devices
- Rugged Construction

The Transmation Model 1098P Precision Pressure Pump is a convenient source of portable pressure for pneumatic testing and pressure loop calibration. Pressure values from -2 to 200 psig can be precisely set to within 0.001 psig using the fine adjustment vernier. Dual output ports located in the machined brass pump body permit simultaneous connection to two devices. The compound-leverage, squeeze action design permits easy one-handed operation at any angle.

SPECIFICATIONS:

Output:	-2 to 200 psig
Resolution:	0.001 psig
Pressure Connections:	1/8"-27 NPT
Weight:	0.9 kg (1.9 lb.)
Construction:	Machined brass pump body

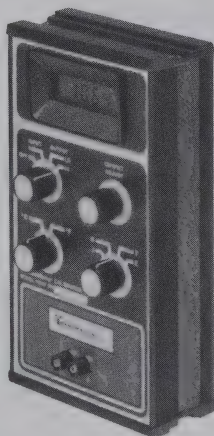
**Transmation
Pressure
Calibration
System**

Contact Transmation, Inc. for additional information.

Thermocouple Calibrator

Model 1064P

- Measures & Simulates Type J, K, T and E Thermocouple Signals
- Readings in Both °F and °C
- Accuracy: $\pm 1^\circ \pm 1$ LSD
- Automatic Cold-Junction Compensation



The Transmation Model 1064P Thermocouple Calibrator is a hand-held digital temperature indicator and calibrator designed to simulate and/or measure type J, K, T and E thermocouple signals. The measured or simulated temperature is indicated directly in °C or °F on the liquid crystal display.

SPECIFICATIONS:

Input Ranges:	J	-200 to +1200°C	-350 to +2190°F
	K	-200 to +1370°C	-350 to +2500°F
	T	-200 to +400°C	-350 to +750°F
	E	-200 to +1000°C	-350 to +1830°F

Accuracy:	$\pm 1^\circ \pm 1$ LSD
Resolution:	$\pm 1^\circ$ (F or C)
Repeatability:	± 1 LSD
Input Impedance:	10 megohms
Output Ranges:	Linearized and cold-junction compensated mV equivalent of input temperature ranges
Output Impedance:	Thermocouple Type J, K, T: 80 ohms maximum Thermocouple Type E: 90 ohms maximum
Recommended Ambient Temperature:	4°C to 50°C (40°F to 122°F)
Display:	4-decade field effect liquid crystal
Update Rate:	3 readings per second
Power Supply:	9V alkaline battery, NEDA 1604; approximately one month typical use
Connectors:	5-way binding posts
Dimensions (HWD):	210 mm x 114 mm x 70 mm (8.25" x 4.5" x 2.75")
Weight:	1.2 kg (2.5 lb.)

Digital Calibrator

Model 1040SP



- Measures & Generates mA, mV & Voltage Signal Ranges
- Simulates 2-wire Transmitter
- Digital Readout
- High Accuracy, Auto Zener Standardization
- Snap-Pack® Battery Cartridge Powered

The Transmation Model 1040SP Digital Calibrator is designed for the calibration of electronic instruments commonly used in the process industries, such as transmitters, recorders, indicators, controllers and computers. The Model 1040SP generates and displays test signals in the range of 0 to 11V, 0 to 110 mV, 0 to 22 mA and 0 to 52 mA, and also simulates a two-wire transmitter in the 0 to 22 mA and 0 to 52 mA mode.

SPECIFICATIONS:

Input Measurement Ranges:	0 to 110 mVDC: 2 megohms input impedance 0 to 11 VDC: 10 megohms input impedance 0 to 22 mADC: 100 ohms input impedance 0 to 52 mADC: 100 ohms input impedance
Measurement Method:	4½-digit integrating DVM, LED display to 11,000 cts.
Output Ranges:	0 to 110 mVDC: 25 megohms output impedance 0 to 11 VDC: 5 ohms output impedance 0 to 22 mADC: 0 to 1300 ohms load 0 to 52 mADC: 0 to 500 ohms load
Transmitter:	0 to 22 mA: 600 ohms at 22 VDC; 1600 ohms at 52 VDC
Simulator Output:	0 to 52 mA: 300 ohms at 22 VDC; 600 ohms at 52 VDC 100 volts maximum DC supply voltage; fuse protected above 100 VDC; exceeds all power and load requirements of ISA-S50.1
Input/Output Calibrated Accuracy:	0 to 110 mVDC: $\pm 0.06\%$ of range, $\pm 0.06\%$ of reading 0 to 11 VDC: $\pm 0.04\%$ of range, $\pm 0.03\%$ of reading 0 to 22 mADC: $\pm 0.12\%$ of range, $\pm 0.06\%$ of reading 0 to 52 mADC: $\pm 0.06\%$ of range, $\pm 0.06\%$ of reading
Warmup Time to Rated Accuracy:	30 seconds maximum on mV IN; 5 seconds maximum on all other ranges
Battery Requirements:	Snap-Pack® Battery Cartridge
Recharge Time:	14 hours
Charge Life:	50 mA continuous output: 1.9 hours 20 mA continuous output: 2.7 hours V or mV continuous input/output: 3.1 hours
Connectors:	Color-coded, 5-way binding posts
Protection:	Zener diode and fuse-protected against misconnection
Dimensions (HWD):	210 mm x 114 mm x 53 mm (8.25" x 4.5" x 2.1")
Weight:	1.4 kg (3 lb.)

Contact Transmation, Inc. for additional information.

TABLE 12 Type R Thermocouples Continued
Temperature in Degrees Celsius (IPTS 1968)

MF in Absolute Millivolts											Reference Junctions at 0 C	
EG C	0	1	2	3	4	5	6	7	8	9	10	DEG C
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
250	13.922	13.936	13.950	13.964	13.978	13.992	14.006	14.020	14.034	14.048	14.062	1.250
260	14.062	14.076	14.090	14.104	14.118	14.132	14.146	14.160	14.174	14.188	14.202	1.260
270	14.202	14.216	14.230	14.244	14.258	14.272	14.286	14.301	14.315	14.329	14.343	1.270
280	14.343	14.357	14.371	14.385	14.399	14.413	14.427	14.441	14.455	14.469	14.483	1.280
290	14.483	14.497	14.511	14.525	14.539	14.554	14.568	14.582	14.596	14.610	14.624	1.290
300	14.624	14.638	14.652	14.666	14.680	14.694	14.708	14.722	14.737	14.751	14.765	1.300
310	14.765	14.779	14.793	14.807	14.821	14.835	14.849	14.863	14.877	14.891	14.906	1.310
320	14.906	14.920	14.934	14.948	14.962	14.976	14.990	15.004	15.018	15.032	15.047	1.320
330	15.047	15.061	15.075	15.089	15.103	15.117	15.131	15.145	15.159	15.173	15.188	1.330
340	15.188	15.202	15.216	15.230	15.244	15.258	15.272	15.286	15.300	15.315	15.329	1.340
350	15.329	15.343	15.357	15.371	15.385	15.399	15.413	15.427	15.442	15.456	15.470	1.350
360	15.470	15.484	15.498	15.512	15.526	15.540	15.555	15.569	15.583	15.597	15.611	1.360
370	15.611	15.625	15.639	15.653	15.667	15.682	15.696	15.710	15.724	15.738	15.752	1.370
380	15.752	15.766	15.780	15.795	15.809	15.823	15.837	15.851	15.865	15.879	15.893	1.380
390	15.893	15.908	15.922	15.936	15.950	15.964	15.978	15.992	16.006	16.021	16.035	1.390
400	16.035	16.049	16.063	16.077	16.091	16.105	16.119	16.134	16.148	16.162	16.176	1.400
410	16.176	16.190	16.204	16.218	16.232	16.247	16.261	16.275	16.289	16.303	16.317	1.410
420	16.317	16.331	16.345	16.360	16.374	16.388	16.402	16.416	16.430	16.444	16.458	1.420
430	16.458	16.472	16.486	16.501	16.515	16.529	16.543	16.557	16.571	16.585	16.599	1.430
440	16.599	16.614	16.628	16.642	16.656	16.670	16.684	16.698	16.712	16.726	16.741	1.440
450	16.741	16.755	16.769	16.783	16.797	16.811	16.825	16.839	16.853	16.867	16.882	1.450
460	16.882	16.896	16.910	16.924	16.938	16.952	16.966	16.980	16.994	17.008	17.022	1.460
470	17.022	17.037	17.051	17.065	17.079	17.093	17.107	17.121	17.135	17.149	17.163	1.470
480	17.163	17.177	17.192	17.206	17.220	17.234	17.248	17.262	17.276	17.290	17.304	1.480
490	17.304	17.318	17.332	17.346	17.360	17.374	17.388	17.403	17.417	17.431	17.445	1.490
500	17.445	17.459	17.473	17.487	17.501	17.515	17.529	17.543	17.557	17.571	17.585	1.500
510	17.585	17.599	17.613	17.627	17.641	17.655	17.669	17.684	17.698	17.712	17.726	1.510
520	17.726	17.740	17.754	17.768	17.782	17.796	17.810	17.824	17.838	17.852	17.866	1.520
530	17.866	17.880	17.894	17.908	17.922	17.936	17.950	17.964	17.978	17.992	18.006	1.530
540	18.006	18.020	18.034	18.048	18.062	18.076	18.090	18.104	18.118	18.132	18.146	1.540
550	18.146	18.160	18.174	18.188	18.202	18.216	18.230	18.244	18.258	18.272	18.286	1.550
560	18.286	18.299	18.313	18.327	18.341	18.355	18.369	18.383	18.397	18.411	18.425	1.560
570	18.425	18.439	18.453	18.467	18.481	18.495	18.509	18.523	18.537	18.550	18.564	1.570
580	18.564	18.578	18.592	18.606	18.620	18.634	18.648	18.662	18.676	18.690	18.703	1.580
590	18.703	18.717	18.731	18.745	18.759	18.773	18.787	18.801	18.815	18.828	18.842	1.590
600	18.842	18.856	18.870	18.884	18.898	18.912	18.926	18.939	18.953	18.967	18.981	1.600
610	18.981	18.995	19.009	19.023	19.036	19.050	19.064	19.078	19.092	19.106	19.119	1.610
620	19.119	19.133	19.147	19.161	19.175	19.188	19.202	19.216	19.230	19.244	19.257	1.620
630	19.257	19.271	19.285	19.299	19.313	19.326	19.340	19.354	19.368	19.382	19.395	1.630
640	19.395	19.409	19.423	19.437	19.450	19.464	19.478	19.492	19.505	19.519	19.533	1.640
650	19.533	19.547	19.560	19.574	19.588	19.602	19.615	19.629	19.643	19.656	19.670	1.650
660	19.670	19.684	19.698	19.711	19.725	19.739	19.752	19.766	19.780	19.793	19.807	1.660
670	19.807	19.821	19.834	19.848	19.862	19.875	19.889	19.903	19.916	19.930	19.944	1.670
680	19.944	19.957	19.971	19.985	19.998	20.012	20.025	20.039	20.053	20.066	20.080	1.680
690	20.080	20.093	20.107	20.120	20.134	20.148	20.161	20.175	20.188	20.202	20.215	1.690
700	20.215	20.229	20.242	20.256	20.269	20.283	20.296	20.309	20.323	20.336	20.350	1.700
710	20.350	20.363	20.377	20.390	20.403	20.417	20.430	20.443	20.457	20.470	20.483	1.710
720	20.483	20.497	20.510	20.523	20.537	20.550	20.563	20.576	20.590	20.603	20.616	1.720
730	20.616	20.629	20.642	20.656	20.669	20.682	20.695	20.708	20.721	20.734	20.748	1.730
740	20.748	20.761	20.774	20.787	20.800	20.813	20.826	20.839	20.852	20.865	20.878	1.740
750	20.878	20.891	20.904	20.916	20.929	20.942	20.955	20.968	20.981	20.994	21.006	1.750
760	21.006	21.019	21.032	21.045	21.057	21.070	21.083	21.096	21.108			1.760
EG C	0	1	2	3	4	5	6	7	8	9	10	DEG C

TABLE 13 Type S Thermocouples
Temperature in Degrees Fahrenheit*

EMF in Absolute Millivolts											Reference Junctions at 32	
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
-50	-0.218	-0.220	-0.222	-0.225	-0.227	-0.229	-0.231	-0.233	-0.236			-50
-40	-0.194	-0.197	-0.199	-0.202	-0.204	-0.206	-0.209	-0.211	-0.213	-0.215	-0.218	-40
-30	-0.170	-0.173	-0.175	-0.178	-0.180	-0.182	-0.185	-0.187	-0.190	-0.192	-0.194	-30
-20	-0.145	-0.148	-0.150	-0.153	-0.155	-0.158	-0.160	-0.163	-0.165	-0.168	-0.170	-20
-10	-0.119	-0.122	-0.124	-0.127	-0.129	-0.132	-0.135	-0.137	-0.140	-0.142	-0.145	-10
-0	-0.092	-0.095	-0.097	-0.100	-0.103	-0.106	-0.108	-0.111	-0.114	-0.116	-0.119	-0
0	-0.092	-0.089	-0.086	-0.084	-0.081	-0.078	-0.075	-0.073	-0.070	-0.067	-0.064	0
10	-0.064	-0.061	-0.058	-0.056	-0.053	-0.050	-0.047	-0.044	-0.041	-0.038	-0.035	10
20	-0.035	-0.033	-0.030	-0.027	-0.024	-0.021	-0.018	-0.015	-0.012	-0.009	-0.006	20
30	-0.006	-0.003	0.000	0.003	0.006	0.009	0.012	0.015	0.018	0.021	0.024	30
40	0.024	0.027	0.030	0.033	0.037	0.040	0.043	0.046	0.049	0.052	0.055	40
50	0.055	0.058	0.062	0.065	0.068	0.071	0.074	0.077	0.081	0.084	0.087	50
60	0.087	0.090	0.093	0.097	0.100	0.103	0.106	0.110	0.113	0.116	0.119	60
70	0.119	0.123	0.126	0.129	0.133	0.136	0.139	0.142	0.146	0.149	0.152	70
80	0.152	0.156	0.159	0.163	0.166	0.169	0.173	0.176	0.179	0.183	0.186	80
90	0.186	0.190	0.193	0.197	0.200	0.203	0.207	0.210	0.214	0.217	0.221	90
100	0.221	0.224	0.228	0.231	0.235	0.238	0.242	0.245	0.249	0.252	0.256	100
110	0.256	0.259	0.263	0.266	0.270	0.274	0.277	0.281	0.284	0.288	0.291	110
120	0.291	0.295	0.299	0.302	0.306	0.309	0.313	0.317	0.320	0.324	0.328	120
130	0.328	0.331	0.335	0.339	0.342	0.346	0.350	0.353	0.357	0.361	0.365	130
140	0.365	0.368	0.372	0.376	0.379	0.383	0.387	0.391	0.394	0.398	0.402	140
150	0.402	0.406	0.409	0.413	0.417	0.421	0.425	0.428	0.432	0.436	0.440	150
160	0.440	0.444	0.448	0.451	0.455	0.459	0.463	0.467	0.471	0.474	0.478	160
170	0.478	0.482	0.486	0.490	0.494	0.498	0.502	0.506	0.510	0.513	0.517	170
180	0.517	0.521	0.525	0.529	0.533	0.537	0.541	0.545	0.549	0.553	0.557	180
190	0.557	0.561	0.565	0.569	0.573	0.577	0.581	0.585	0.589	0.593	0.597	190
200	0.597	0.601	0.605	0.609	0.613	0.617	0.621	0.625	0.629	0.633	0.637	200
210	0.637	0.641	0.645	0.649	0.653	0.658	0.662	0.666	0.670	0.674	0.678	210
220	0.678	0.682	0.686	0.690	0.695	0.699	0.703	0.707	0.711	0.715	0.719	220
230	0.719	0.724	0.728	0.732	0.736	0.740	0.744	0.749	0.753	0.757	0.761	230
240	0.761	0.765	0.770	0.774	0.778	0.782	0.786	0.791	0.795	0.799	0.803	240
250	0.803	0.808	0.812	0.816	0.820	0.824	0.829	0.833	0.837	0.842	0.846	250
260	0.846	0.850	0.854	0.859	0.863	0.867	0.872	0.876	0.880	0.884	0.889	260
270	0.889	0.893	0.897	0.902	0.906	0.910	0.915	0.919	0.923	0.928	0.932	270
280	0.932	0.936	0.941	0.945	0.950	0.954	0.958	0.963	0.967	0.971	0.976	280
290	0.976	0.980	0.985	0.989	0.993	0.998	1.002	1.007	1.011	1.015	1.020	290
300	1.020	1.024	1.029	1.033	1.038	1.042	1.046	1.051	1.055	1.060	1.064	300
310	1.064	1.069	1.073	1.078	1.082	1.087	1.091	1.095	1.100	1.104	1.109	310
320	1.109	1.113	1.118	1.122	1.127	1.131	1.136	1.140	1.145	1.149	1.154	320
330	1.154	1.158	1.163	1.168	1.172	1.177	1.181	1.186	1.190	1.195	1.199	330
340	1.199	1.204	1.208	1.213	1.218	1.222	1.227	1.231	1.236	1.240	1.245	340
350	1.245	1.250	1.254	1.259	1.263	1.268	1.273	1.277	1.282	1.286	1.291	350
360	1.291	1.296	1.300	1.305	1.309	1.314	1.319	1.323	1.328	1.333	1.337	360
370	1.337	1.342	1.347	1.351	1.356	1.360	1.365	1.370	1.374	1.379	1.384	370
380	1.384	1.388	1.393	1.398	1.402	1.407	1.412	1.417	1.421	1.426	1.431	380
390	1.431	1.435	1.440	1.445	1.449	1.454	1.459	1.464	1.468	1.473	1.478	390
400	1.478	1.482	1.487	1.492	1.497	1.501	1.506	1.511	1.516	1.520	1.525	400
410	1.525	1.530	1.535	1.539	1.544	1.549	1.554	1.558	1.563	1.568	1.573	410
420	1.573	1.577	1.582	1.587	1.592	1.597	1.601	1.606	1.611	1.616	1.620	420
430	1.620	1.625	1.630	1.635	1.640	1.644	1.649	1.654	1.659	1.664	1.669	430
440	1.669	1.673	1.678	1.683	1.688	1.693	1.698	1.702	1.707	1.712	1.717	440
450	1.717	1.722	1.727	1.731	1.736	1.741	1.746	1.751	1.756	1.761	1.765	450
460	1.765	1.770	1.775	1.780	1.785	1.790	1.795	1.799	1.804	1.809	1.814	460
470	1.814	1.819	1.824	1.829	1.834	1.839	1.843	1.848	1.853	1.858	1.863	470
480	1.863	1.868	1.873	1.878	1.883	1.888	1.893	1.898	1.902	1.907	1.912	480
490	1.912	1.917	1.922	1.927	1.932	1.937	1.942	1.947	1.952	1.957	1.962	490
500	1.962	1.967	1.972	1.977	1.981	1.986	1.991	1.996	2.001	2.006	2.011	500
510	2.011	2.016	2.021	2.026	2.031	2.036	2.041	2.046	2.051	2.056	2.061	510
520	2.061	2.066	2.071	2.076	2.081	2.086	2.091	2.096	2.101	2.106	2.111	520
530	2.111	2.116	2.121	2.126	2.131	2.136	2.141	2.146	2.151	2.156	2.161	530
540	2.161	2.166	2.171	2.176	2.181	2.186	2.191	2.196	2.201	2.206	2.211	540
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F

* Converted from degrees Celsius (IPTS 1968)

TABLE 13 Type S Thermocouples Continued

Temperature in Degrees Fahrenheit*

EMF in Absolute Millivolts

Reference Junctions at 32 F

DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
550	2.211	2.216	2.221	2.227	2.232	2.237	2.242	2.247	2.252	2.257	2.262	550
560	2.262	2.267	2.272	2.277	2.282	2.287	2.292	2.297	2.302	2.307	2.313	560
570	2.313	2.318	2.323	2.328	2.333	2.338	2.343	2.348	2.353	2.358	2.363	570
580	2.363	2.368	2.374	2.379	2.384	2.389	2.394	2.399	2.404	2.409	2.414	580
590	2.414	2.419	2.425	2.430	2.435	2.440	2.445	2.450	2.455	2.460	2.465	590
600	2.465	2.471	2.476	2.481	2.486	2.491	2.496	2.501	2.506	2.512	2.517	600
610	2.517	2.522	2.527	2.532	2.537	2.542	2.548	2.553	2.558	2.563	2.568	610
620	2.568	2.573	2.578	2.584	2.589	2.594	2.599	2.604	2.609	2.615	2.620	620
630	2.620	2.625	2.630	2.635	2.640	2.646	2.651	2.656	2.661	2.666	2.672	630
640	2.672	2.677	2.682	2.687	2.692	2.697	2.703	2.708	2.713	2.718	2.723	640
650	2.723	2.729	2.734	2.739	2.744	2.749	2.755	2.760	2.765	2.770	2.775	650
660	2.775	2.781	2.786	2.791	2.796	2.801	2.807	2.812	2.817	2.822	2.828	660
670	2.828	2.833	2.838	2.843	2.848	2.854	2.859	2.864	2.869	2.875	2.880	670
680	2.880	2.885	2.890	2.895	2.901	2.906	2.911	2.916	2.922	2.927	2.932	680
690	2.932	2.937	2.943	2.948	2.953	2.958	2.964	2.969	2.974	2.979	2.985	690
700	2.985	2.990	2.995	3.000	3.006	3.011	3.016	3.022	3.027	3.032	3.037	700
710	3.037	3.043	3.048	3.053	3.058	3.064	3.069	3.074	3.080	3.085	3.090	710
720	3.090	3.095	3.101	3.106	3.111	3.117	3.122	3.127	3.132	3.138	3.143	720
730	3.143	3.148	3.154	3.159	3.164	3.169	3.175	3.180	3.185	3.191	3.196	730
740	3.196	3.201	3.207	3.212	3.217	3.223	3.228	3.233	3.238	3.244	3.249	740
750	3.249	3.254	3.260	3.265	3.270	3.276	3.281	3.286	3.292	3.297	3.302	750
760	3.302	3.308	3.313	3.318	3.324	3.329	3.334	3.340	3.345	3.350	3.356	760
770	3.356	3.361	3.366	3.372	3.377	3.382	3.388	3.393	3.398	3.404	3.409	770
780	3.409	3.414	3.420	3.425	3.430	3.436	3.441	3.447	3.452	3.457	3.463	780
790	3.463	3.468	3.473	3.479	3.484	3.489	3.495	3.500	3.506	3.511	3.516	790
800	3.516	3.522	3.527	3.532	3.538	3.543	3.549	3.554	3.559	3.565	3.570	800
810	3.570	3.575	3.581	3.586	3.592	3.597	3.602	3.608	3.613	3.619	3.624	810
820	3.624	3.629	3.635	3.640	3.645	3.651	3.656	3.662	3.667	3.672	3.678	820
830	3.678	3.683	3.689	3.694	3.699	3.705	3.710	3.716	3.721	3.726	3.732	830
840	3.732	3.737	3.743	3.748	3.754	3.759	3.764	3.770	3.775	3.781	3.786	840
850	3.786	3.791	3.797	3.802	3.808	3.813	3.819	3.824	3.829	3.835	3.840	850
860	3.840	3.846	3.851	3.857	3.862	3.867	3.873	3.878	3.884	3.889	3.895	860
870	3.895	3.900	3.906	3.911	3.916	3.922	3.927	3.933	3.938	3.944	3.949	870
880	3.949	3.955	3.960	3.965	3.971	3.976	3.982	3.987	3.993	3.998	4.004	880
890	4.004	4.009	4.015	4.020	4.025	4.031	4.036	4.042	4.047	4.053	4.058	890
900	4.058	4.064	4.069	4.075	4.080	4.086	4.091	4.096	4.102	4.107	4.113	900
910	4.113	4.118	4.124	4.129	4.135	4.140	4.146	4.151	4.157	4.162	4.168	910
920	4.168	4.173	4.179	4.184	4.190	4.195	4.201	4.206	4.212	4.217	4.223	920
930	4.223	4.228	4.234	4.239	4.245	4.250	4.256	4.261	4.267	4.272	4.278	930
940	4.278	4.283	4.289	4.294	4.300	4.305	4.311	4.316	4.322	4.327	4.333	940
950	4.333	4.338	4.344	4.349	4.355	4.360	4.366	4.371	4.377	4.382	4.388	950
960	4.388	4.393	4.399	4.404	4.410	4.415	4.421	4.426	4.432	4.438	4.443	960
970	4.443	4.449	4.454	4.460	4.465	4.471	4.476	4.482	4.487	4.493	4.498	970
980	4.498	4.504	4.509	4.515	4.521	4.526	4.532	4.537	4.543	4.548	4.554	980
990	4.554	4.559	4.565	4.570	4.576	4.582	4.587	4.593	4.598	4.604	4.609	990
1.000	4.609	4.615	4.620	4.626	4.632	4.637	4.643	4.648	4.654	4.659	4.665	1.000
1.010	4.665	4.670	4.676	4.682	4.687	4.693	4.698	4.704	4.709	4.715	4.721	1.010
1.020	4.721	4.726	4.732	4.737	4.743	4.748	4.754	4.760	4.765	4.771	4.776	1.020
1.030	4.776	4.782	4.788	4.793	4.799	4.804	4.810	4.815	4.821	4.827	4.832	1.030
1.040	4.832	4.838	4.843	4.849	4.855	4.860	4.866	4.871	4.877	4.883	4.888	1.040
1.050	4.888	4.894	4.899	4.905	4.911	4.916	4.922	4.927	4.933	4.939	4.944	1.050
1.060	4.944	4.950	4.956	4.961	4.967	4.972	4.978	4.984	4.989	4.995	5.000	1.060
1.070	5.000	5.006	5.012	5.017	5.023	5.029	5.034	5.040	5.045	5.051	5.057	1.070
1.080	5.057	5.062	5.068	5.074	5.079	5.085	5.090	5.096	5.102	5.107	5.113	1.080
1.090	5.113	5.119	5.124	5.130	5.136	5.141	5.147	5.153	5.158	5.164	5.169	1.090
1.100	5.169	5.175	5.181	5.186	5.192	5.198	5.203	5.209	5.215	5.220	5.226	1.100
1.110	5.226	5.232	5.237	5.243	5.249	5.254	5.260	5.266	5.271	5.277	5.283	1.110
1.120	5.283	5.288	5.294	5.300	5.305	5.311	5.317	5.322	5.328	5.334	5.339	1.120
1.130	5.339	5.345	5.351	5.356	5.362	5.368	5.373	5.379	5.385	5.391	5.396	1.130
1.140	5.396	5.402	5.408	5.413	5.419	5.425	5.430	5.436	5.442	5.447	5.453	1.140
1.150	5.453	5.459	5.465	5.470	5.476	5.482	5.487	5.493	5.499	5.504	5.510	1.150
1.160	5.510	5.516	5.522	5.527	5.533	5.539	5.544	5.550	5.556	5.562	5.567	1.160
1.170	5.567	5.573	5.579	5.585	5.590	5.596	5.602	5.608	5.613	5.619	5.625	1.170
1.180	5.625	5.631	5.636	5.642	5.648	5.653	5.659	5.665	5.671	5.676	5.682	1.180
1.190	5.682	5.688	5.694	5.700	5.705	5.711	5.717	5.723	5.728	5.734	5.740	1.190
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F

* Converted from degrees Celsius (IPTS 1968).

TABLE 13 Type S Thermocouples Continued

Temperature in Degrees Fahrenheit*

EMF in Absolute Millivolts

Reference Junctions at 32 F

DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
1,200	5.740	5.746	5.751	5.757	5.763	5.769	5.774	5.780	5.786	5.792	5.797	1,200
1,210	5.797	5.803	5.809	5.815	5.821	5.826	5.832	5.838	5.844	5.849	5.855	1,210
1,220	5.855	5.861	5.867	5.873	5.878	5.884	5.890	5.896	5.902	5.907	5.913	1,220
1,230	5.913	5.919	5.925	5.931	5.936	5.942	5.948	5.954	5.960	5.965	5.971	1,230
1,240	5.971	5.977	5.983	5.989	5.994	6.000	6.006	6.012	6.018	6.023	6.029	1,240
1,250	6.029	6.035	6.041	6.047	6.052	6.058	6.064	6.070	6.076	6.082	6.087	1,250
1,260	6.087	6.093	6.099	6.105	6.111	6.117	6.122	6.128	6.134	6.140	6.146	1,260
1,270	6.146	6.152	6.157	6.163	6.169	6.175	6.181	6.187	6.192	6.198	6.204	1,270
1,280	6.204	6.210	6.216	6.222	6.227	6.233	6.239	6.245	6.251	6.257	6.263	1,280
1,290	6.263	6.268	6.274	6.280	6.286	6.292	6.298	6.304	6.309	6.315	6.321	1,290
1,300	6.321	6.327	6.333	6.339	6.345	6.350	6.356	6.362	6.368	6.374	6.380	1,300
1,310	6.380	6.386	6.392	6.397	6.403	6.409	6.415	6.421	6.427	6.433	6.439	1,310
1,320	6.439	6.445	6.450	6.456	6.462	6.468	6.474	6.480	6.486	6.492	6.498	1,320
1,330	6.498	6.503	6.509	6.515	6.521	6.527	6.533	6.539	6.545	6.551	6.557	1,330
1,340	6.557	6.562	6.568	6.574	6.580	6.586	6.592	6.598	6.604	6.610	6.616	1,340
1,350	6.616	6.622	6.627	6.633	6.639	6.645	6.651	6.657	6.663	6.669	6.675	1,350
1,360	6.675	6.681	6.687	6.693	6.699	6.704	6.710	6.716	6.722	6.728	6.734	1,360
1,370	6.734	6.740	6.746	6.752	6.758	6.764	6.770	6.776	6.782	6.788	6.794	1,370
1,380	6.794	6.800	6.805	6.811	6.817	6.823	6.829	6.835	6.841	6.847	6.853	1,380
1,390	6.853	6.859	6.865	6.871	6.877	6.883	6.889	6.895	6.901	6.907	6.913	1,390
1,400	6.913	6.919	6.925	6.931	6.937	6.943	6.948	6.954	6.960	6.966	6.972	1,400
1,410	6.972	6.978	6.984	6.990	6.996	7.002	7.008	7.014	7.020	7.026	7.032	1,410
1,420	7.032	7.038	7.044	7.050	7.056	7.062	7.068	7.074	7.080	7.086	7.092	1,420
1,430	7.092	7.098	7.104	7.110	7.116	7.122	7.128	7.134	7.140	7.146	7.152	1,430
1,440	7.152	7.158	7.164	7.170	7.176	7.182	7.188	7.194	7.200	7.206	7.212	1,440
1,450	7.212	7.218	7.224	7.230	7.236	7.242	7.248	7.254	7.260	7.266	7.272	1,450
1,460	7.272	7.278	7.284	7.290	7.297	7.303	7.309	7.315	7.321	7.327	7.333	1,460
1,470	7.333	7.339	7.345	7.351	7.357	7.363	7.369	7.375	7.381	7.387	7.393	1,470
1,480	7.393	7.399	7.405	7.411	7.417	7.423	7.429	7.435	7.442	7.448	7.454	1,480
1,490	7.454	7.460	7.466	7.472	7.478	7.484	7.490	7.496	7.502	7.508	7.514	1,490
1,500	7.514	7.520	7.526	7.533	7.539	7.545	7.551	7.557	7.563	7.569	7.575	1,500
1,510	7.575	7.581	7.587	7.593	7.599	7.605	7.612	7.618	7.624	7.630	7.636	1,510
1,520	7.636	7.642	7.648	7.654	7.660	7.666	7.672	7.679	7.685	7.691	7.697	1,520
1,530	7.697	7.703	7.709	7.715	7.721	7.727	7.733	7.740	7.746	7.752	7.758	1,530
1,540	7.758	7.764	7.770	7.776	7.782	7.788	7.795	7.801	7.807	7.813	7.819	1,540
1,550	7.819	7.825	7.831	7.837	7.843	7.850	7.856	7.862	7.868	7.874	7.880	1,550
1,560	7.880	7.886	7.892	7.899	7.905	7.911	7.917	7.923	7.929	7.935	7.942	1,560
1,570	7.942	7.948	7.954	7.960	7.966	7.972	7.978	7.985	7.991	7.997	8.003	1,570
1,580	8.003	8.009	8.015	8.021	8.028	8.034	8.040	8.046	8.052	8.058	8.065	1,580
1,590	8.065	8.071	8.077	8.083	8.089	8.095	8.101	8.108	8.114	8.120	8.126	1,590
1,600	8.126	8.132	8.138	8.145	8.151	8.157	8.163	8.169	8.176	8.182	8.188	1,600
1,610	8.188	8.194	8.200	8.206	8.213	8.219	8.225	8.231	8.237	8.244	8.250	1,610
1,620	8.250	8.256	8.262	8.268	8.275	8.281	8.287	8.293	8.299	8.305	8.312	1,620
1,630	8.312	8.318	8.324	8.330	8.336	8.343	8.349	8.355	8.361	8.368	8.374	1,630
1,640	8.374	8.380	8.386	8.392	8.399	8.405	8.411	8.417	8.423	8.430	8.436	1,640
1,650	8.436	8.442	8.448	8.455	8.461	8.467	8.473	8.479	8.486	8.492	8.498	1,650
1,660	8.498	8.504	8.511	8.517	8.523	8.529	8.536	8.542	8.548	8.554	8.560	1,660
1,670	8.560	8.567	8.573	8.579	8.585	8.592	8.598	8.604	8.610	8.617	8.623	1,670
1,680	8.623	8.629	8.635	8.642	8.648	8.654	8.660	8.667	8.673	8.679	8.685	1,680
1,690	8.685	8.692	8.698	8.704	8.711	8.717	8.723	8.729	8.736	8.742	8.748	1,690
1,700	8.748	8.754	8.761	8.767	8.773	8.780	8.786	8.792	8.798	8.805	8.811	1,700
1,710	8.811	8.817	8.823	8.830	8.836	8.842	8.849	8.855	8.861	8.867	8.874	1,710
1,720	8.874	8.880	8.886	8.893	8.899	8.905	8.912	8.918	8.924	8.930	8.937	1,720
1,730	8.937	8.943	8.949	8.956	8.962	8.968	8.975	8.981	8.987	8.993	9.000	1,730
1,740	9.000	9.006	9.012	9.019	9.025	9.031	9.038	9.044	9.050	9.057	9.063	1,740
1,750	9.063	9.069	9.076	9.082	9.088	9.095	9.101	9.107	9.114	9.120	9.126	1,750
1,760	9.126	9.133	9.139	9.145	9.152	9.158	9.164	9.171	9.177	9.183	9.190	1,760
1,770	9.190	9.196	9.202	9.209	9.215	9.221	9.228	9.234	9.240	9.247	9.253	1,770
1,780	9.253	9.259	9.266	9.272	9.278	9.285	9.291	9.298	9.304	9.310	9.317	1,780
1,790	9.317	9.323	9.329	9.336	9.342	9.348	9.355	9.361	9.368	9.374	9.380	1,790
1,800	9.380	9.387	9.393	9.399	9.406	9.412	9.419	9.425	9.431	9.438	9.444	1,800
1,810	9.444	9.450	9.457	9.463	9.470	9.476	9.482	9.489	9.495	9.502	9.508	1,810
1,820	9.508	9.514	9.521	9.527	9.533	9.540	9.546	9.553	9.559	9.565	9.572	1,820
1,830	9.572	9.578	9.585	9.591	9.598	9.604	9.610	9.617	9.623	9.630	9.636	1,830
1,840	9.636	9.642	9.649	9.655	9.662	9.668	9.674	9.681	9.687	9.694	9.700	1,840

DEG F 0 1 2 3 4 5 6 7 8 9 10 DEG F

* Converted from degrees Celsius (IPTS 1968).

TABLE 13 Type S Thermocouples Continued

Temperature in Degrees Fahrenheit°

EMF in Absolute Millivolts

Reference Junctions at 32 F

DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
1.850	9.700	9.707	9.713	9.719	9.726	9.732	9.739	9.745	9.752	9.758	9.764	1.850
1.860	9.764	9.771	9.777	9.784	9.790	9.797	9.803	9.809	9.816	9.822	9.829	1.860
1.870	9.829	9.835	9.842	9.848	9.855	9.861	9.867	9.874	9.880	9.887	9.893	1.870
1.880	9.893	9.900	9.906	9.913	9.919	9.926	9.932	9.938	9.945	9.951	9.958	1.880
1.890	9.958	9.964	9.971	9.977	9.984	9.990	9.997	10.003	10.010	10.016	10.023	1.890
1.900	10.023	10.029	10.036	10.042	10.048	10.055	10.061	10.068	10.074	10.081	10.087	1.900
1.910	10.087	10.094	10.100	10.107	10.113	10.120	10.126	10.133	10.139	10.146	10.152	1.910
1.920	10.152	10.159	10.165	10.172	10.178	10.185	10.191	10.198	10.204	10.211	10.217	1.920
1.930	10.217	10.224	10.230	10.237	10.243	10.250	10.256	10.263	10.269	10.276	10.282	1.930
1.940	10.282	10.289	10.295	10.302	10.308	10.315	10.321	10.328	10.334	10.341	10.348	1.940
1.950	10.348	10.354	10.361	10.367	10.374	10.380	10.387	10.393	10.400	10.406	10.413	1.950
1.960	10.413	10.419	10.426	10.432	10.439	10.445	10.452	10.459	10.465	10.472	10.478	1.960
1.970	10.478	10.485	10.491	10.498	10.504	10.511	10.517	10.524	10.531	10.537	10.544	1.970
1.980	10.544	10.550	10.557	10.563	10.570	10.576	10.583	10.589	10.596	10.603	10.609	1.980
1.990	10.609	10.616	10.622	10.629	10.635	10.642	10.648	10.655	10.662	10.668	10.675	1.990
2.000	10.675	10.681	10.688	10.694	10.701	10.708	10.714	10.721	10.727	10.734	10.740	2.000
2.010	10.740	10.747	10.754	10.760	10.767	10.773	10.780	10.786	10.793	10.800	10.806	2.010
2.020	10.806	10.813	10.819	10.826	10.832	10.839	10.846	10.852	10.859	10.865	10.872	2.020
2.030	10.872	10.879	10.885	10.892	10.898	10.905	10.912	10.918	10.925	10.931	10.938	2.030
2.040	10.938	10.944	10.951	10.958	10.964	10.971	10.977	10.984	10.991	10.997	11.004	2.040
2.050	11.004	11.010	11.017	11.024	11.030	11.037	11.043	11.050	11.057	11.063	11.070	2.050
2.060	11.070	11.076	11.083	11.090	11.096	11.103	11.110	11.116	11.123	11.129	11.136	2.060
2.070	11.136	11.143	11.149	11.156	11.162	11.169	11.176	11.182	11.189	11.196	11.202	2.070
2.080	11.202	11.209	11.215	11.222	11.229	11.235	11.242	11.248	11.255	11.262	11.268	2.080
2.090	11.268	11.275	11.282	11.288	11.295	11.301	11.308	11.315	11.321	11.328	11.335	2.090
2.100	11.335	11.341	11.348	11.355	11.361	11.368	11.374	11.381	11.388	11.394	11.401	2.100
2.110	11.401	11.408	11.414	11.421	11.428	11.434	11.441	11.447	11.454	11.461	11.467	2.110
2.120	11.467	11.474	11.481	11.487	11.494	11.501	11.507	11.514	11.521	11.527	11.534	2.120
2.130	11.534	11.541	11.547	11.554	11.560	11.567	11.574	11.580	11.587	11.594	11.600	2.130
2.140	11.600	11.607	11.614	11.620	11.627	11.634	11.640	11.647	11.654	11.660	11.667	2.140
2.150	11.667	11.674	11.680	11.687	11.694	11.700	11.707	11.714	11.720	11.727	11.734	2.150
2.160	11.734	11.740	11.747	11.754	11.760	11.767	11.774	11.780	11.787	11.794	11.800	2.160
2.170	11.800	11.807	11.814	11.820	11.827	11.834	11.840	11.847	11.854	11.860	11.867	2.170
2.180	11.867	11.874	11.880	11.887	11.894	11.900	11.907	11.914	11.920	11.927	11.934	2.180
2.190	11.934	11.940	11.947	11.954	11.960	11.967	11.974	11.980	11.987	11.994	12.001	2.190
2.200	12.001	12.007	12.014	12.021	12.027	12.034	12.041	12.047	12.054	12.061	12.067	2.200
2.210	12.067	12.074	12.081	12.087	12.094	12.101	12.107	12.114	12.121	12.128	12.134	2.210
2.220	12.134	12.141	12.148	12.154	12.161	12.168	12.174	12.181	12.188	12.194	12.201	2.220
2.230	12.201	12.208	12.215	12.221	12.228	12.235	12.241	12.248	12.255	12.261	12.268	2.230
2.240	12.268	12.275	12.282	12.288	12.295	12.302	12.308	12.315	12.322	12.328	12.335	2.240
2.250	12.335	12.342	12.349	12.355	12.362	12.369	12.375	12.382	12.389	12.395	12.402	2.250
2.260	12.402	12.409	12.416	12.422	12.429	12.436	12.442	12.449	12.456	12.463	12.469	2.260
2.270	12.469	12.476	12.483	12.489	12.496	12.503	12.510	12.516	12.523	12.530	12.536	2.270
2.280	12.536	12.543	12.550	12.557	12.563	12.570	12.577	12.583	12.590	12.597	12.604	2.280
2.290	12.604	12.610	12.617	12.624	12.630	12.637	12.644	12.651	12.657	12.664	12.671	2.290
2.300	12.671	12.677	12.684	12.691	12.698	12.704	12.711	12.718	12.724	12.731	12.738	2.300
2.310	12.738	12.745	12.751	12.758	12.765	12.771	12.778	12.785	12.792	12.798	12.805	2.310
2.320	12.805	12.812	12.819	12.825	12.832	12.839	12.845	12.852	12.859	12.866	12.872	2.320
2.330	12.872	12.879	12.886	12.893	12.899	12.906	12.913	12.919	12.926	12.933	12.940	2.330
2.340	12.940	12.946	12.953	12.960	12.967	12.973	12.980	12.987	12.993	13.000	13.007	2.340
2.350	13.007	13.014	13.020	13.027	13.034	13.041	13.047	13.054	13.061	13.067	13.074	2.350
2.360	13.074	13.081	13.088	13.094	13.101	13.108	13.115	13.121	13.128	13.135	13.142	2.360
2.370	13.142	13.148	13.155	13.162	13.168	13.175	13.182	13.189	13.195	13.202	13.209	2.370
2.380	13.209	13.216	13.222	13.229	13.236	13.243	13.249	13.256	13.263	13.269	13.276	2.380
2.390	13.276	13.283	13.290	13.296	13.303	13.310	13.317	13.323	13.330	13.337	13.344	2.390
2.400	13.344	13.350	13.357	13.364	13.371	13.377	13.384	13.391	13.397	13.404	13.411	2.400
2.410	13.411	13.418	13.424	13.431	13.438	13.445	13.451	13.458	13.465	13.472	13.478	2.410
2.420	13.478	13.485	13.492	13.499	13.505	13.512	13.519	13.526	13.532	13.539	13.546	2.420
2.430	13.546	13.552	13.559	13.566	13.573	13.579	13.586	13.593	13.600	13.606	13.613	2.430
2.440	13.613	13.620	13.627	13.633	13.640	13.647	13.654	13.660	13.667	13.674	13.681	2.440
2.450	13.681	13.687	13.694	13.701	13.708	13.714	13.721	13.728	13.734	13.741	13.748	2.450
2.460	13.748	13.755	13.761	13.768	13.775	13.782	13.788	13.795	13.802	13.809	13.815	2.460
2.470	13.815	13.822	13.829	13.836	13.842	13.849	13.856	13.863	13.869	13.876	13.883	2.470
2.480	13.883	13.890	13.896	13.903	13.910	13.916	13.923	13.930	13.937	13.943	13.950	2.480
2.490	13.950	13.957	13.964	13.970	13.977	13.984	13.991	13.997	14.004	14.011	14.018	2.490
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F

* Converted from degrees Celsius (IPTS 1968).

TABLE 13 Type S Thermocouples Continued

Temperature in Degrees Fahrenheit*

EMF in Absolute Millivolts

Reference Junctions at 32 F

DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
2,500	14.018	14.024	14.031	14.038	14.045	14.051	14.058	14.065	14.072	14.078	14.085	2,500
2,510	14.085	14.092	14.098	14.105	14.112	14.119	14.125	14.132	14.139	14.146	14.152	2,510
2,520	14.152	14.159	14.166	14.173	14.179	14.186	14.193	14.200	14.206	14.213	14.220	2,520
2,530	14.220	14.226	14.233	14.240	14.247	14.253	14.260	14.267	14.274	14.280	14.287	2,530
2,540	14.287	14.294	14.301	14.307	14.314	14.321	14.328	14.334	14.341	14.348	14.354	2,540
2,550	14.354	14.361	14.368	14.375	14.381	14.388	14.395	14.402	14.408	14.415	14.422	2,550
2,560	14.422	14.429	14.435	14.442	14.449	14.455	14.462	14.469	14.476	14.482	14.489	2,560
2,570	14.489	14.496	14.503	14.509	14.516	14.523	14.530	14.536	14.543	14.550	14.556	2,570
2,580	14.556	14.563	14.570	14.577	14.583	14.590	14.597	14.604	14.610	14.617	14.624	2,580
2,590	14.624	14.631	14.637	14.644	14.651	14.657	14.664	14.671	14.678	14.684	14.691	2,590
2,600	14.691	14.698	14.705	14.711	14.718	14.725	14.731	14.738	14.745	14.752	14.758	2,600
2,610	14.758	14.765	14.772	14.778	14.785	14.792	14.799	14.805	14.812	14.819	14.826	2,610
2,620	14.826	14.832	14.839	14.846	14.852	14.859	14.866	14.873	14.879	14.886	14.893	2,620
2,630	14.893	14.899	14.906	14.913	14.920	14.926	14.933	14.940	14.946	14.953	14.960	2,630
2,640	14.960	14.967	14.973	14.980	14.987	14.994	15.000	15.007	15.014	15.020	15.027	2,640
2,650	15.027	15.034	15.041	15.047	15.054	15.061	15.067	15.074	15.081	15.088	15.094	2,650
2,660	15.094	15.101	15.108	15.114	15.121	15.128	15.134	15.141	15.148	15.155	15.161	2,660
2,670	15.161	15.168	15.175	15.181	15.188	15.195	15.202	15.208	15.215	15.222	15.228	2,670
2,680	15.228	15.235	15.242	15.248	15.255	15.262	15.269	15.275	15.282	15.289	15.295	2,680
2,690	15.295	15.302	15.309	15.315	15.322	15.329	15.336	15.342	15.349	15.356	15.362	2,690
2,700	15.362	15.369	15.376	15.382	15.389	15.396	15.403	15.409	15.416	15.423	15.429	2,700
2,710	15.429	15.436	15.443	15.449	15.456	15.463	15.469	15.476	15.483	15.490	15.496	2,710
2,720	15.496	15.503	15.510	15.516	15.523	15.530	15.536	15.543	15.550	15.556	15.563	2,720
2,730	15.563	15.570	15.576	15.583	15.590	15.597	15.603	15.610	15.617	15.623	15.630	2,730
2,740	15.630	15.637	15.643	15.650	15.657	15.663	15.670	15.677	15.683	15.690	15.697	2,740
2,750	15.697	15.703	15.710	15.717	15.723	15.730	15.737	15.743	15.750	15.757	15.763	2,750
2,760	15.763	15.770	15.777	15.783	15.790	15.797	15.804	15.810	15.817	15.824	15.830	2,760
2,770	15.830	15.837	15.844	15.850	15.857	15.864	15.870	15.877	15.883	15.890	15.897	2,770
2,780	15.897	15.903	15.910	15.917	15.923	15.930	15.937	15.943	15.950	15.957	15.963	2,780
2,790	15.963	15.970	15.977	15.983	15.990	15.997	16.003	16.010	16.017	16.023	16.030	2,790
2,800	16.030	16.037	16.043	16.050	16.057	16.063	16.070	16.077	16.083	16.090	16.096	2,800
2,810	16.096	16.103	16.110	16.116	16.123	16.130	16.136	16.143	16.150	16.156	16.163	2,810
2,820	16.163	16.170	16.176	16.183	16.189	16.196	16.203	16.209	16.216	16.223	16.229	2,820
2,830	16.229	16.236	16.243	16.249	16.256	16.262	16.269	16.276	16.282	16.289	16.296	2,830
2,840	16.296	16.302	16.309	16.315	16.322	16.329	16.335	16.342	16.349	16.355	16.362	2,840
2,850	16.362	16.368	16.375	16.382	16.388	16.395	16.402	16.408	16.415	16.421	16.428	2,850
2,860	16.428	16.435	16.441	16.448	16.454	16.461	16.468	16.474	16.481	16.488	16.494	2,860
2,870	16.494	16.501	16.507	16.514	16.521	16.527	16.534	16.540	16.547	16.554	16.560	2,870
2,880	16.560	16.567	16.573	16.580	16.587	16.593	16.600	16.606	16.613	16.620	16.626	2,880
2,890	16.626	16.633	16.639	16.646	16.653	16.659	16.666	16.672	16.679	16.686	16.692	2,890
2,900	16.692	16.699	16.705	16.712	16.719	16.725	16.732	16.738	16.745	16.751	16.758	2,900
2,910	16.758	16.765	16.771	16.778	16.784	16.791	16.797	16.804	16.811	16.817	16.824	2,910
2,920	16.824	16.830	16.837	16.844	16.850	16.857	16.863	16.870	16.876	16.883	16.890	2,920
2,930	16.890	16.896	16.903	16.909	16.916	16.922	16.929	16.935	16.942	16.949	16.955	2,930
2,940	16.955	16.962	16.968	16.975	16.981	16.988	16.995	17.001	17.008	17.014	17.021	2,940
2,950	17.021	17.027	17.034	17.040	17.047	17.053	17.060	17.067	17.073	17.080	17.086	2,950
2,960	17.086	17.093	17.099	17.106	17.112	17.119	17.125	17.132	17.139	17.145	17.152	2,960
2,970	17.152	17.158	17.165	17.171	17.178	17.184	17.191	17.197	17.204	17.210	17.217	2,970
2,980	17.217	17.223	17.230	17.237	17.243	17.250	17.256	17.263	17.269	17.276	17.282	2,980
2,990	17.282	17.289	17.295	17.302	17.308	17.315	17.321	17.328	17.334	17.341	17.347	2,990
3,000	17.347	17.354	17.360	17.367	17.373	17.380	17.386	17.393	17.399	17.406	17.412	3,000
3,010	17.412	17.419	17.425	17.432	17.438	17.445	17.451	17.458	17.464	17.471	17.477	3,010
3,020	17.477	17.484	17.490	17.497	17.503	17.510	17.516	17.523	17.529	17.536	17.542	3,020
3,030	17.542	17.549	17.555	17.562	17.568	17.575	17.581	17.588	17.594	17.601	17.607	3,030
3,040	17.607	17.614	17.620	17.627	17.633	17.639	17.646	17.652	17.659	17.665	17.672	3,040
3,050	17.672	17.678	17.685	17.691	17.698	17.704	17.711	17.717	17.723	17.730	17.736	3,050
3,060	17.736	17.743	17.749	17.756	17.762	17.769	17.775	17.781	17.788	17.794	17.801	3,060
3,070	17.801	17.807	17.814	17.820	17.826	17.833	17.839	17.846	17.852	17.859	17.865	3,070
3,080	17.865	17.871	17.878	17.884	17.891	17.897	17.903	17.910	17.916	17.923	17.929	3,080
3,090	17.929	17.935	17.942	17.948	17.954	17.961	17.967	17.974	17.980	17.986	17.993	3,090
3,100	17.993	17.999	18.005	18.012	18.018	18.024	18.031	18.037	18.043	18.050	18.056	3,100
3,110	18.056	18.063	18.069	18.075	18.081	18.088	18.094	18.100	18.107	18.113	18.119	3,110
3,120	18.119	18.125	18.132	18.138	18.145	18.151	18.157	18.163	18.170	18.176	18.182	3,120
3,130	18.182	18.189	18.195	18.201	18.207	18.214	18.220	18.226	18.232	18.239	18.245	3,130
3,140	18.245	18.251	18.257	18.264	18.270	18.276	18.282	18.289	18.295	18.301	18.307	3,140

* Converted from degrees Celsius (IPTS 1968).

Temperature in Degrees Fahrenheit^a

Reference Junctions at 32 F

F	0	1	2	3	4	5	6	7	8	9	10	DEG F
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
50	18.307	18.313	18.320	18.326	18.332	18.338	18.344	18.351	18.357	18.363	18.369	3.150
60	18.369	18.375	18.381	18.388	18.394	18.400	18.406	18.412	18.418	18.424	18.431	3.160
70	18.431	18.437	18.443	18.449	18.455	18.461	18.467	18.473	18.479	18.486	18.492	3.170
80	18.492	18.498	18.504	18.510	18.516	18.522	18.528	18.534	18.540	18.546	18.552	3.180
90	18.552	18.558	18.564	18.570	18.576	18.582	18.588	18.594	18.600	18.606	18.612	3.190
00	18.612	18.618	18.624	18.630	18.636	18.642	18.648	18.654	18.660	18.666	18.672	3.200
10	18.672	18.678	18.684	18.690	18.696							3.210
F	0	1	2	3	4	5	6	7	8	9	10	DEG F

Converted from degrees Celsius (IPTS 1968).

TABLE 14 Type S Thermocouples
Temperature in Degrees Celsius (IPTS 1968)

EMF in Absolute Millivolts

Reference Junctions at 0

DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
-50	-0.236											-50
-40	-0.194	-0.199	-0.203	-0.207	-0.211	-0.215	-0.220	-0.224	-0.228	-0.232	-0.236	-40
-30	-0.150	-0.155	-0.159	-0.164	-0.168	-0.173	-0.177	-0.181	-0.186	-0.190	-0.194	-30
-20	-0.103	-0.108	-0.112	-0.117	-0.122	-0.127	-0.132	-0.136	-0.141	-0.145	-0.150	-20
-10	-0.053	-0.058	-0.063	-0.068	-0.073	-0.078	-0.083	-0.088	-0.093	-0.098	-0.103	-10
0	0.000	-0.005	-0.011	-0.016	-0.021	-0.027	-0.032	-0.037	-0.042	-0.048	-0.053	0
10	0.000	0.005	0.011	0.016	0.022	0.027	0.033	0.038	0.044	0.050	0.055	10
20	0.055	0.061	0.067	0.072	0.078	0.084	0.090	0.095	0.101	0.107	0.113	20
30	0.113	0.119	0.125	0.131	0.137	0.142	0.148	0.154	0.161	0.167	0.173	30
40	0.173	0.179	0.185	0.191	0.197	0.203	0.210	0.216	0.222	0.228	0.235	40
50	0.235	0.241	0.247	0.254	0.260	0.266	0.273	0.279	0.286	0.292	0.299	50
60	0.299	0.305	0.312	0.318	0.325	0.331	0.338	0.345	0.351	0.358	0.365	60
70	0.365	0.371	0.378	0.385	0.391	0.398	0.405	0.412	0.419	0.425	0.432	70
80	0.432	0.439	0.446	0.453	0.460	0.467	0.474	0.481	0.488	0.495	0.502	80
90	0.502	0.509	0.516	0.523	0.530	0.537	0.544	0.551	0.558	0.566	0.573	90
100	0.573	0.580	0.587	0.594	0.602	0.609	0.616	0.623	0.631	0.638	0.645	100
110	0.645	0.653	0.660	0.667	0.675	0.682	0.690	0.697	0.704	0.712	0.719	110
120	0.719	0.727	0.734	0.742	0.749	0.757	0.764	0.772	0.780	0.787	0.795	120
130	0.795	0.802	0.810	0.818	0.825	0.833	0.841	0.848	0.856	0.864	0.872	130
140	0.872	0.879	0.887	0.895	0.903	0.910	0.918	0.926	0.934	0.942	0.950	140
150	0.950	0.957	0.965	0.973	0.981	0.989	0.997	1.005	1.013	1.021	1.029	150
160	1.029	1.037	1.045	1.053	1.061	1.069	1.077	1.085	1.093	1.101	1.109	160
170	1.109	1.117	1.125	1.133	1.141	1.149	1.158	1.166	1.174	1.182	1.190	170
180	1.190	1.198	1.207	1.215	1.223	1.231	1.240	1.248	1.256	1.264	1.273	180
190	1.273	1.281	1.289	1.297	1.306	1.314	1.322	1.331	1.339	1.347	1.356	190
200	1.356	1.364	1.373	1.381	1.389	1.398	1.406	1.415	1.423	1.432	1.440	200
210	1.440	1.448	1.457	1.465	1.474	1.482	1.491	1.499	1.508	1.516	1.525	210
220	1.525	1.534	1.542	1.551	1.559	1.568	1.576	1.585	1.594	1.602	1.611	220
230	1.611	1.620	1.628	1.637	1.645	1.654	1.663	1.671	1.680	1.689	1.698	230
240	1.698	1.706	1.715	1.724	1.732	1.741	1.750	1.759	1.767	1.776	1.785	240
250	1.785	1.794	1.802	1.811	1.820	1.829	1.838	1.846	1.855	1.864	1.873	250
260	1.873	1.882	1.891	1.899	1.908	1.917	1.926	1.935	1.944	1.953	1.962	260
270	1.962	1.971	1.979	1.988	1.997	2.006	2.015	2.024	2.033	2.042	2.051	270
280	2.051	2.060	2.069	2.078	2.087	2.096	2.105	2.114	2.123	2.132	2.141	280
290	2.141	2.150	2.159	2.168	2.177	2.186	2.195	2.204	2.213	2.222	2.232	290
300	2.232	2.241	2.250	2.259	2.268	2.277	2.286	2.295	2.304	2.314	2.323	300
310	2.323	2.332	2.341	2.350	2.359	2.368	2.378	2.387	2.396	2.405	2.414	310
320	2.414	2.424	2.433	2.442	2.451	2.460	2.470	2.479	2.488	2.497	2.506	320
330	2.506	2.516	2.525	2.534	2.543	2.553	2.562	2.571	2.581	2.590	2.599	330
340	2.599	2.608	2.618	2.627	2.636	2.646	2.655	2.664	2.674	2.683	2.692	340
350	2.692	2.702	2.711	2.720	2.730	2.739	2.748	2.758	2.767	2.776	2.786	350
360	2.786	2.795	2.805	2.814	2.823	2.833	2.842	2.852	2.861	2.870	2.880	360
370	2.880	2.889	2.899	2.908	2.917	2.927	2.936	2.946	2.955	2.965	2.974	370
380	2.974	2.984	2.993	3.003	3.012	3.022	3.031	3.041	3.050	3.059	3.069	380
390	3.069	3.078	3.088	3.097	3.107	3.117	3.126	3.136	3.145	3.155	3.164	390
400	3.164	3.174	3.183	3.193	3.202	3.212	3.221	3.231	3.241	3.250	3.260	400
410	3.260	3.269	3.279	3.288	3.298	3.308	3.317	3.327	3.336	3.346	3.356	410
420	3.356	3.365	3.375	3.384	3.394	3.404	3.413	3.423	3.433	3.442	3.452	420
430	3.452	3.462	3.471	3.481	3.491	3.500	3.510	3.520	3.529	3.539	3.549	430
440	3.549	3.558	3.568	3.578	3.587	3.597	3.607	3.616	3.626	3.636	3.645	440
450	3.645	3.655	3.665	3.675	3.684	3.694	3.704	3.714	3.723	3.733	3.743	450
460	3.743	3.752	3.762	3.772	3.782	3.791	3.801	3.811	3.821	3.831	3.840	460
470	3.840	3.850	3.860	3.870	3.879	3.889	3.899	3.909	3.919	3.928	3.938	470
480	3.938	3.948	3.958	3.968	3.977	3.987	3.997	4.007	4.017	4.027	4.036	480
490	4.036	4.046	4.056	4.066	4.076	4.086	4.095	4.105	4.115	4.125	4.135	490
500	4.135	4.145	4.155	4.164	4.174	4.184	4.194	4.204	4.214	4.224	4.234	500
510	4.234	4.243	4.253	4.263	4.273	4.283	4.293	4.303	4.313	4.323	4.333	510
520	4.333	4.343	4.352	4.362	4.372	4.382	4.392	4.402	4.412	4.422	4.432	520
530	4.432	4.442	4.452	4.462	4.472	4.482	4.492	4.502	4.512	4.522	4.532	530
540	4.532	4.542	4.552	4.562	4.572	4.582	4.592	4.602	4.612	4.622	4.632	540
550	4.632	4.642	4.652	4.662	4.672	4.682	4.692	4.702	4.712	4.722	4.732	550
560	4.732	4.742	4.752	4.762	4.772	4.782	4.792	4.802	4.812	4.822	4.832	560
570	4.832	4.842	4.852	4.862	4.872	4.882	4.893	4.903	4.913	4.923	4.933	570
580	4.933	4.943	4.953	4.963	4.973	4.984	4.994	5.004	5.014	5.024	5.034	580
590	5.034	5.044	5.054	5.065	5.075	5.085	5.095	5.105	5.115	5.125	5.136	590
600	5.136	5.146	5.156	5.166	5.176	5.186	5.197	5.207	5.217	5.227	5.237	600

0 1 2 3 4 5 6 7 8 9 10 DEG C

TABLE 14 Type S Thermocouples Continued
 Temperature in Degrees Celsius (IPTS 1968)

EMF in Absolute Millivolts

Reference Junctions at 0 C

DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
600	5.237	5.247	5.258	5.268	5.278	5.288	5.298	5.309	5.319	5.329	5.339	600
610	5.339	5.350	5.360	5.370	5.380	5.391	5.401	5.411	5.421	5.431	5.442	610
620	5.442	5.452	5.462	5.473	5.483	5.493	5.503	5.514	5.524	5.534	5.544	620
630	5.544	5.555	5.565	5.575	5.586	5.596	5.606	5.617	5.627	5.637	5.648	630
640	5.648	5.658	5.668	5.679	5.689	5.700	5.710	5.720	5.731	5.741	5.751	640
650	5.751	5.762	5.772	5.782	5.793	5.803	5.814	5.824	5.834	5.845	5.855	650
660	5.855	5.866	5.876	5.887	5.897	5.907	5.918	5.928	5.939	5.949	5.960	660
670	5.960	5.970	5.980	5.991	6.001	6.012	6.022	6.033	6.043	6.054	6.064	670
680	6.064	6.075	6.085	6.096	6.106	6.117	6.127	6.138	6.148	6.159	6.169	680
690	6.169	6.180	6.190	6.201	6.211	6.222	6.232	6.243	6.253	6.264	6.274	690
700	6.274	6.285	6.295	6.306	6.316	6.327	6.338	6.348	6.359	6.369	6.380	700
710	6.380	6.390	6.401	6.412	6.422	6.433	6.443	6.454	6.465	6.475	6.486	710
720	6.486	6.496	6.507	6.518	6.528	6.539	6.549	6.560	6.571	6.581	6.592	720
730	6.592	6.603	6.613	6.624	6.635	6.645	6.656	6.667	6.677	6.688	6.699	730
740	6.699	6.709	6.720	6.731	6.741	6.752	6.763	6.773	6.784	6.795	6.805	740
750	6.805	6.816	6.827	6.838	6.848	6.859	6.870	6.880	6.891	6.902	6.913	750
760	6.913	6.923	6.934	6.945	6.956	6.966	6.977	6.988	6.999	7.009	7.020	760
770	7.020	7.031	7.042	7.053	7.063	7.074	7.085	7.096	7.107	7.117	7.128	770
780	7.128	7.139	7.150	7.161	7.171	7.182	7.193	7.204	7.215	7.225	7.236	780
790	7.236	7.247	7.258	7.269	7.280	7.291	7.301	7.312	7.323	7.334	7.345	790
800	7.345	7.356	7.367	7.377	7.388	7.399	7.410	7.421	7.432	7.443	7.454	800
810	7.454	7.465	7.476	7.486	7.497	7.508	7.519	7.530	7.541	7.552	7.563	810
820	7.563	7.574	7.585	7.596	7.607	7.618	7.629	7.640	7.651	7.661	7.672	820
830	7.672	7.683	7.694	7.705	7.716	7.727	7.738	7.749	7.760	7.771	7.782	830
840	7.782	7.793	7.804	7.815	7.826	7.837	7.848	7.859	7.870	7.881	7.892	840
850	7.892	7.904	7.915	7.926	7.937	7.948	7.959	7.970	7.981	7.992	8.003	850
860	8.003	8.014	8.025	8.036	8.047	8.058	8.069	8.081	8.092	8.103	8.114	860
870	8.114	8.125	8.136	8.147	8.158	8.169	8.180	8.192	8.203	8.214	8.225	870
880	8.225	8.236	8.247	8.258	8.270	8.281	8.292	8.303	8.314	8.325	8.336	880
890	8.336	8.348	8.359	8.370	8.381	8.392	8.404	8.415	8.426	8.437	8.448	890
900	8.448	8.460	8.471	8.482	8.493	8.504	8.516	8.527	8.538	8.549	8.560	900
910	8.560	8.572	8.583	8.594	8.605	8.617	8.628	8.639	8.650	8.662	8.673	910
920	8.673	8.684	8.695	8.707	8.718	8.729	8.741	8.752	8.763	8.774	8.786	920
930	8.786	8.797	8.808	8.820	8.831	8.842	8.854	8.865	8.876	8.888	8.899	930
940	8.899	8.910	8.922	8.933	8.944	8.956	8.967	8.978	8.990	9.001	9.012	940
950	9.012	9.024	9.035	9.047	9.058	9.069	9.081	9.092	9.103	9.115	9.126	950
960	9.126	9.138	9.149	9.160	9.172	9.183	9.195	9.206	9.217	9.229	9.240	960
970	9.240	9.252	9.263	9.275	9.286	9.298	9.309	9.320	9.332	9.343	9.355	970
980	9.355	9.366	9.378	9.389	9.401	9.412	9.424	9.435	9.447	9.458	9.470	980
990	9.470	9.481	9.493	9.504	9.516	9.527	9.539	9.550	9.562	9.573	9.585	990
1,000	9.585	9.596	9.608	9.619	9.631	9.642	9.654	9.665	9.677	9.689	9.700	1,000
1,010	9.700	9.712	9.723	9.735	9.746	9.758	9.770	9.781	9.793	9.804	9.816	1,010
1,020	9.816	9.828	9.839	9.851	9.862	9.874	9.886	9.897	9.909	9.920	9.932	1,020
1,030	9.932	9.944	9.955	9.967	9.979	9.990	10.002	10.013	10.025	10.037	10.048	1,030
1,040	10.048	10.060	10.072	10.083	10.095	10.107	10.118	10.130	10.142	10.154	10.165	1,040
1,050	10.165	10.177	10.189	10.200	10.212	10.224	10.235	10.247	10.259	10.271	10.282	1,050
1,060	10.282	10.294	10.306	10.318	10.329	10.341	10.353	10.364	10.376	10.388	10.400	1,060
1,070	10.400	10.411	10.423	10.435	10.447	10.459	10.470	10.482	10.494	10.506	10.517	1,070
1,080	10.517	10.529	10.541	10.553	10.565	10.576	10.588	10.600	10.612	10.624	10.635	1,080
1,090	10.635	10.647	10.659	10.671	10.683	10.694	10.706	10.718	10.730	10.742	10.754	1,090
1,100	10.754	10.765	10.777	10.789	10.801	10.813	10.825	10.836	10.848	10.860	10.872	1,100
1,110	10.872	10.884	10.896	10.908	10.919	10.931	10.943	10.955	10.967	10.979	10.991	1,110
1,120	10.991	11.003	11.014	11.026	11.038	11.050	11.062	11.074	11.086	11.098	11.110	1,120
1,130	11.110	11.121	11.133	11.145	11.157	11.169	11.181	11.193	11.205	11.217	11.229	1,130
1,140	11.229	11.241	11.252	11.264	11.276	11.288	11.300	11.312	11.324	11.336	11.348	1,140
1,150	11.348	11.360	11.372	11.384	11.396	11.408	11.420	11.432	11.444	11.455	11.467	1,150
1,160	11.467	11.479	11.491	11.503	11.515	11.527	11.539	11.551	11.563	11.575	11.587	1,160
1,170	11.587	11.599	11.611	11.623	11.635	11.647	11.659	11.671	11.683	11.695	11.707	1,170
1,180	11.707	11.719	11.731	11.743	11.755	11.767	11.779	11.791	11.803	11.815	11.827	1,180
1,190	11.827	11.839	11.851	11.863	11.875	11.887	11.899	11.911	11.923	11.935	11.947	1,190
1,200	11.947	11.959	11.971	11.983	11.995	12.007	12.019	12.031	12.043	12.055	12.067	1,200
1,210	12.067	12.079	12.091	12.103	12.116	12.128	12.140	12.152	12.164	12.176	12.188	1,210
1,220	12.188	12.200	12.212	12.224	12.236	12.248	12.260	12.272	12.284	12.296	12.308	1,220
1,230	12.308	12.320	12.332	12.345	12.357	12.369	12.381	12.393	12.405	12.417	12.429	1,230
1,240	12.429	12.441	12.453	12.465	12.477	12.489	12.501	12.514	12.526	12.538	12.550	1,240
DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C

TABLE 14 Type S Thermocouples Continued
Temperature in Degrees Celsius (IPTS 1968)

EMF in Absolute Millivolts

Reference Junctions at 0 C

DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
1,250	12,550	12,562	12,574	12,586	12,598	12,610	12,622	12,634	12,647	12,659	12,671	1,250
1,260	12,671	12,683	12,695	12,707	12,719	12,731	12,743	12,755	12,767	12,780	12,792	1,260
1,270	12,792	12,804	12,816	12,828	12,840	12,852	12,864	12,876	12,888	12,901	12,913	1,270
1,280	12,913	12,925	12,937	12,949	12,961	12,973	12,985	12,997	13,010	13,022	13,034	1,280
1,290	13,034	13,046	13,058	13,070	13,082	13,094	13,107	13,119	13,131	13,143	13,155	1,290
1,300	13,155	13,167	13,179	13,191	13,203	13,216	13,228	13,240	13,252	13,264	13,276	1,300
1,310	13,276	13,288	13,300	13,312	13,325	13,337	13,349	13,361	13,373	13,385	13,397	1,310
1,320	13,397	13,410	13,422	13,434	13,446	13,458	13,470	13,482	13,495	13,507	13,519	1,320
1,330	13,519	13,531	13,543	13,555	13,567	13,579	13,592	13,604	13,616	13,628	13,640	1,330
1,340	13,640	13,652	13,664	13,677	13,689	13,701	13,713	13,725	13,737	13,749	13,761	1,340
1,350	13,761	13,774	13,786	13,798	13,810	13,822	13,834	13,846	13,859	13,871	13,883	1,350
1,360	13,883	13,895	13,907	13,919	13,931	13,943	13,956	13,968	13,980	13,992	14,004	1,360
1,370	14,004	14,016	14,028	14,040	14,053	14,065	14,077	14,089	14,101	14,113	14,125	1,370
1,380	14,125	14,138	14,150	14,162	14,174	14,186	14,198	14,210	14,222	14,235	14,247	1,380
1,390	14,247	14,259	14,271	14,283	14,295	14,307	14,319	14,332	14,344	14,356	14,368	1,390
1,400	14,368	14,380	14,392	14,404	14,416	14,429	14,441	14,453	14,465	14,477	14,489	1,400
1,410	14,489	14,501	14,513	14,526	14,538	14,550	14,562	14,574	14,586	14,598	14,610	1,410
1,420	14,610	14,622	14,635	14,647	14,659	14,671	14,683	14,695	14,707	14,719	14,731	1,420
1,430	14,731	14,744	14,756	14,768	14,780	14,792	14,804	14,816	14,828	14,840	14,852	1,430
1,440	14,852	14,865	14,877	14,889	14,901	14,913	14,925	14,937	14,949	14,961	14,973	1,440
1,450	14,973	14,985	14,998	15,010	15,022	15,034	15,046	15,058	15,070	15,082	15,094	1,450
1,460	15,094	15,106	15,118	15,130	15,143	15,155	15,167	15,179	15,191	15,203	15,215	1,460
1,470	15,215	15,227	15,239	15,251	15,263	15,275	15,287	15,299	15,311	15,324	15,336	1,470
1,480	15,336	15,348	15,360	15,372	15,384	15,396	15,408	15,420	15,432	15,444	15,456	1,480
1,490	15,456	15,468	15,480	15,492	15,504	15,516	15,528	15,540	15,552	15,564	15,576	1,490
1,500	15,576	15,589	15,601	15,613	15,625	15,637	15,649	15,661	15,673	15,685	15,697	1,500
1,510	15,697	15,709	15,721	15,733	15,745	15,757	15,769	15,781	15,793	15,805	15,817	1,510
1,520	15,817	15,829	15,841	15,853	15,865	15,877	15,889	15,901	15,913	15,925	15,937	1,520
1,530	15,937	15,949	15,961	15,973	15,985	15,997	16,009	16,021	16,033	16,045	16,057	1,530
1,540	16,057	16,069	16,080	16,092	16,104	16,116	16,128	16,140	16,152	16,164	16,176	1,540
1,550	16,176	16,188	16,200	16,212	16,224	16,236	16,248	16,260	16,272	16,284	16,296	1,550
1,560	16,296	16,308	16,319	16,331	16,343	16,355	16,367	16,379	16,391	16,403	16,415	1,560
1,570	16,415	16,427	16,439	16,451	16,462	16,474	16,486	16,498	16,510	16,522	16,534	1,570
1,580	16,534	16,546	16,558	16,569	16,581	16,593	16,605	16,617	16,629	16,641	16,653	1,580
1,590	16,653	16,664	16,676	16,688	16,700	16,712	16,724	16,736	16,747	16,759	16,771	1,590
1,600	16,771	16,783	16,795	16,807	16,819	16,830	16,842	16,854	16,866	16,878	16,890	1,600
1,610	16,890	16,901	16,913	16,925	16,937	16,949	16,960	16,972	16,984	16,996	17,008	1,610
1,620	17,008	17,019	17,031	17,043	17,055	17,067	17,078	17,090	17,102	17,114	17,125	1,620
1,630	17,125	17,137	17,149	17,161	17,173	17,184	17,196	17,208	17,220	17,231	17,243	1,630
1,640	17,243	17,255	17,267	17,278	17,290	17,302	17,313	17,325	17,337	17,349	17,360	1,640
1,650	17,360	17,372	17,384	17,396	17,407	17,419	17,431	17,442	17,454	17,466	17,477	1,650
1,660	17,477	17,489	17,501	17,512	17,524	17,536	17,548	17,559	17,571	17,583	17,594	1,660
1,670	17,594	17,606	17,617	17,629	17,641	17,652	17,664	17,676	17,687	17,699	17,711	1,670
1,680	17,711	17,722	17,734	17,745	17,757	17,769	17,780	17,792	17,803	17,815	17,826	1,680
1,690	17,826	17,838	17,850	17,861	17,873	17,884	17,896	17,907	17,919	17,930	17,942	1,690
1,700	17,942	17,953	17,965	17,976	17,988	17,999	18,010	18,022	18,033	18,045	18,056	1,700
1,710	18,056	18,068	18,079	18,090	18,102	18,113	18,124	18,136	18,147	18,158	18,170	1,710
1,720	18,170	18,181	18,192	18,204	18,215	18,226	18,237	18,249	18,260	18,271	18,282	1,720
1,730	18,282	18,293	18,305	18,316	18,327	18,338	18,349	18,360	18,372	18,383	18,394	1,730
1,740	18,394	18,405	18,416	18,427	18,438	18,449	18,460	18,471	18,482	18,493	18,504	1,740
1,750	18,504	18,515	18,526	18,536	18,547	18,558	18,569	18,580	18,591	18,602	18,612	1,750
1,760	18,612	18,623	18,634	18,645	18,655	18,666	18,677	18,687	18,698			1,760
DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C

TABLE 15 Type T Thermocouples
Temperature in Degrees Fahrenheit*

EMF in Absolute Millivolts

Reference Junctions at 32 F

DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
-450	-6.254	-6.255	-6.256	-6.257	-6.258							-450
-440	-6.240	-6.242	-6.243	-6.245	-6.247	-6.248	-6.250	-6.251	-6.252	-6.253	-6.254	-440
-430	-6.217	-6.220	-6.223	-6.225	-6.227	-6.230	-6.232	-6.234	-6.236	-6.238	-6.240	-430
-420	-6.187	-6.191	-6.194	-6.197	-6.200	-6.203	-6.206	-6.209	-6.212	-6.215	-6.217	-420
-410	-6.150	-6.154	-6.158	-6.162	-6.166	-6.170	-6.173	-6.177	-6.181	-6.184	-6.187	-410
-400	-6.105	-6.110	-6.115	-6.119	-6.124	-6.128	-6.133	-6.137	-6.142	-6.146	-6.150	-400
-390	-6.053	-6.059	-6.064	-6.069	-6.075	-6.080	-6.085	-6.090	-6.095	-6.100	-6.105	-390
-380	-5.995	-6.001	-6.007	-6.013	-6.019	-6.025	-6.030	-6.036	-6.042	-6.048	-6.053	-380
-370	-5.930	-5.937	-5.943	-5.950	-5.957	-5.963	-5.969	-5.976	-5.982	-5.988	-5.995	-370
-360	-5.860	-5.867	-5.874	-5.881	-5.889	-5.896	-5.903	-5.910	-5.916	-5.923	-5.930	-360
-350	-5.785	-5.792	-5.800	-5.808	-5.815	-5.823	-5.830	-5.838	-5.845	-5.853	-5.860	-350
-340	-5.705	-5.713	-5.721	-5.729	-5.737	-5.745	-5.753	-5.761	-5.769	-5.777	-5.785	-340
-330	-5.620	-5.629	-5.638	-5.646	-5.655	-5.663	-5.672	-5.680	-5.688	-5.697	-5.705	-330
-320	-5.532	-5.541	-5.550	-5.559	-5.568	-5.576	-5.585	-5.594	-5.603	-5.612	-5.620	-320
-310	-5.439	-5.448	-5.457	-5.467	-5.476	-5.486	-5.495	-5.504	-5.513	-5.522	-5.532	-310
-300	-5.341	-5.351	-5.361	-5.371	-5.381	-5.390	-5.400	-5.410	-5.419	-5.429	-5.439	-300
-290	-5.240	-5.250	-5.261	-5.271	-5.281	-5.291	-5.301	-5.311	-5.321	-5.331	-5.341	-290
-280	-5.135	-5.145	-5.156	-5.167	-5.177	-5.188	-5.198	-5.209	-5.219	-5.230	-5.240	-280
-270	-5.035	-5.046	-5.057	-5.068	-5.079	-5.089	-5.099	-5.109	-5.119	-5.129	-5.139	-270
-260	-4.932	-4.943	-4.954	-4.965	-4.976	-4.986	-4.996	-5.006	-5.016	-5.026	-5.036	-260
-250	-4.794	-4.806	-4.818	-4.830	-4.842	-4.853	-4.865	-4.877	-4.889	-4.900	-4.912	-250
-240	-4.673	-4.685	-4.698	-4.710	-4.722	-4.734	-4.746	-4.758	-4.770	-4.782	-4.794	-240
-230	-4.548	-4.560	-4.573	-4.586	-4.598	-4.611	-4.623	-4.636	-4.648	-4.661	-4.673	-230
-220	-4.419	-4.432	-4.445	-4.458	-4.471	-4.484	-4.497	-4.509	-4.522	-4.535	-4.548	-220
-210	-4.286	-4.299	-4.313	-4.326	-4.339	-4.353	-4.366	-4.379	-4.392	-4.406	-4.419	-210
-200	-4.149	-4.163	-4.177	-4.191	-4.204	-4.218	-4.232	-4.245	-4.259	-4.272	-4.286	-200
-190	-4.009	-4.023	-4.037	-4.051	-4.065	-4.079	-4.093	-4.107	-4.121	-4.135	-4.149	-190
-180	-3.864	-3.879	-3.894	-3.908	-3.923	-3.937	-3.951	-3.966	-3.980	-3.994	-4.009	-180
-170	-3.717	-3.732	-3.746	-3.761	-3.776	-3.791	-3.806	-3.820	-3.835	-3.850	-3.864	-170
-160	-3.565	-3.580	-3.596	-3.611	-3.626	-3.641	-3.656	-3.671	-3.687	-3.702	-3.717	-160
-150	-3.410	-3.425	-3.441	-3.457	-3.472	-3.488	-3.503	-3.519	-3.534	-3.550	-3.565	-150
-140	-3.251	-3.267	-3.283	-3.299	-3.315	-3.331	-3.347	-3.362	-3.378	-3.394	-3.410	-140
-130	-3.089	-3.105	-3.121	-3.138	-3.154	-3.170	-3.186	-3.203	-3.219	-3.235	-3.251	-130
-120	-2.923	-2.939	-2.956	-2.973	-2.989	-3.006	-3.023	-3.039	-3.056	-3.072	-3.089	-120
-110	-2.753	-2.771	-2.788	-2.805	-2.822	-2.838	-2.855	-2.872	-2.889	-2.906	-2.923	-110
-100	-2.581	-2.598	-2.616	-2.633	-2.650	-2.667	-2.685	-2.702	-2.719	-2.736	-2.753	-100
-90	-2.405	-2.422	-2.440	-2.458	-2.475	-2.493	-2.511	-2.528	-2.546	-2.563	-2.581	-90
-80	-2.225	-2.243	-2.261	-2.279	-2.297	-2.315	-2.333	-2.351	-2.369	-2.387	-2.405	-80
-70	-2.042	-2.061	-2.079	-2.098	-2.116	-2.134	-2.152	-2.171	-2.189	-2.207	-2.225	-70
-60	-1.856	-1.875	-1.894	-1.912	-1.931	-1.950	-1.968	-1.987	-2.005	-2.024	-2.042	-60
-50	-1.667	-1.686	-1.705	-1.724	-1.743	-1.762	-1.781	-1.800	-1.819	-1.838	-1.856	-50
-40	-1.475	-1.494	-1.513	-1.533	-1.552	-1.571	-1.591	-1.610	-1.629	-1.648	-1.667	-40
-30	-1.279	-1.299	-1.319	-1.338	-1.358	-1.377	-1.397	-1.416	-1.436	-1.455	-1.475	-30
-20	-1.081	-1.101	-1.121	-1.141	-1.160	-1.180	-1.200	-1.220	-1.240	-1.260	-1.279	-20
-10	-0.879	-0.899	-0.920	-0.940	-0.960	-0.980	-1.000	-1.021	-1.041	-1.061	-1.081	-10
-0	-0.674	-0.695	-0.716	-0.736	-0.757	-0.777	-0.798	-0.818	-0.838	-0.859	-0.879	-0
0	-0.674	-0.654	-0.633	-0.613	-0.592	-0.571	-0.550	-0.529	-0.509	-0.488	-0.467	0
10	-0.467	-0.446	-0.425	-0.404	-0.383	-0.362	-0.341	-0.320	-0.299	-0.277	-0.256	10
20	-0.256	-0.235	-0.214	-0.193	-0.171	-0.150	-0.129	-0.107	-0.086	-0.064	-0.043	20
30	-0.043	-0.022	0.000	0.022	0.043	0.065	0.086	0.108	0.130	0.151	0.173	30
40	0.173	0.195	0.216	0.238	0.260	0.282	0.303	0.325	0.347	0.369	0.391	40
50	0.391	0.413	0.435	0.457	0.479	0.501	0.523	0.545	0.567	0.589	0.611	50
60	0.611	0.634	0.656	0.678	0.700	0.722	0.745	0.767	0.789	0.812	0.834	60
70	0.834	0.857	0.879	0.902	0.924	0.947	0.969	0.992	1.014	1.037	1.060	70
80	1.060	1.082	1.105	1.128	1.151	1.173	1.196	1.219	1.242	1.265	1.288	80
90	1.288	1.311	1.334	1.357	1.380	1.403	1.426	1.449	1.472	1.495	1.518	90
100	1.518	1.542	1.565	1.588	1.611	1.635	1.658	1.681	1.705	1.728	1.752	100
110	1.752	1.775	1.799	1.822	1.846	1.869	1.893	1.917	1.940	1.964	1.988	110
120	1.988	2.011	2.035	2.059	2.083	2.107	2.131	2.154	2.178	2.202	2.226	120
130	2.226	2.250	2.274	2.298	2.322	2.347	2.371	2.395	2.419	2.443	2.467	130
140	2.467	2.492	2.516	2.540	2.565	2.589	2.613	2.638	2.662	2.687	2.711	140
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F

* Converted from degrees Celsius (IPST 1968).

TABLE 15 Type T Thermocouples Continued

Temperature in Degrees Fahrenheit*

EMF in Absolute Millivolts

Reference Junctions at 32 F

DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
150	2.711	2.736	2.760	2.785	2.809	2.834	2.859	2.883	2.908	2.933	2.958	150
160	2.958	2.982	3.007	3.032	3.057	3.082	3.107	3.131	3.156	3.181	3.206	160
170	3.206	3.231	3.256	3.281	3.307	3.332	3.357	3.382	3.407	3.432	3.458	170
180	3.458	3.483	3.508	3.533	3.559	3.584	3.609	3.635	3.660	3.686	3.711	180
190	3.711	3.737	3.762	3.788	3.813	3.839	3.864	3.890	3.916	3.941	3.967	190
200	3.967	3.993	4.019	4.044	4.070	4.096	4.122	4.148	4.174	4.199	4.225	200
210	4.225	4.251	4.277	4.303	4.329	4.355	4.381	4.408	4.434	4.460	4.486	210
220	4.486	4.512	4.538	4.565	4.591	4.617	4.643	4.670	4.696	4.722	4.749	220
230	4.749	4.775	4.801	4.828	4.854	4.881	4.907	4.934	4.960	4.987	5.014	230
240	5.014	5.040	5.067	5.093	5.120	5.147	5.174	5.200	5.227	5.254	5.281	240
250	5.281	5.307	5.334	5.361	5.388	5.415	5.442	5.469	5.496	5.523	5.550	250
260	5.550	5.577	5.604	5.631	5.658	5.685	5.712	5.739	5.767	5.794	5.821	260
270	5.821	5.848	5.875	5.903	5.930	5.957	5.985	6.012	6.039	6.067	6.094	270
280	6.094	6.122	6.149	6.177	6.204	6.232	6.259	6.287	6.314	6.342	6.369	280
290	6.369	6.397	6.425	6.452	6.480	6.508	6.536	6.563	6.591	6.619	6.647	290
300	6.647	6.675	6.702	6.730	6.758	6.786	6.814	6.842	6.870	6.898	6.926	300
310	6.926	6.954	6.982	7.010	7.038	7.066	7.094	7.122	7.151	7.179	7.207	310
320	7.207	7.235	7.263	7.292	7.320	7.348	7.377	7.405	7.433	7.462	7.490	320
330	7.490	7.518	7.547	7.575	7.604	7.632	7.661	7.689	7.718	7.746	7.775	330
340	7.775	7.804	7.832	7.861	7.889	7.918	7.947	7.975	8.004	8.033	8.062	340
350	8.062	8.090	8.119	8.148	8.177	8.206	8.235	8.264	8.292	8.321	8.350	350
360	8.350	8.379	8.408	8.437	8.466	8.495	8.524	8.553	8.583	8.612	8.641	360
370	8.641	8.670	8.699	8.728	8.757	8.787	8.816	8.845	8.874	8.904	8.933	370
380	8.933	8.962	8.992	9.021	9.050	9.080	9.109	9.139	9.168	9.198	9.227	380
390	9.227	9.257	9.286	9.316	9.345	9.375	9.404	9.434	9.464	9.493	9.523	390
400	9.523	9.553	9.582	9.612	9.642	9.671	9.701	9.731	9.761	9.791	9.820	400
410	9.820	9.850	9.880	9.910	9.940	9.970	10.000	10.030	10.060	10.090	10.120	410
420	10.120	10.150	10.180	10.210	10.240	10.270	10.300	10.330	10.360	10.390	10.420	420
430	10.420	10.451	10.481	10.511	10.541	10.572	10.602	10.632	10.662	10.693	10.723	430
440	10.723	10.753	10.784	10.814	10.845	10.875	10.905	10.936	10.966	10.997	11.027	440
450	11.027	11.058	11.088	11.119	11.149	11.180	11.211	11.241	11.272	11.302	11.333	450
460	11.333	11.364	11.394	11.425	11.456	11.487	11.517	11.548	11.579	11.610	11.640	460
470	11.640	11.671	11.702	11.733	11.764	11.795	11.826	11.856	11.887	11.918	11.949	470
480	11.949	11.980	12.011	12.042	12.073	12.104	12.135	12.166	12.198	12.229	12.260	480
490	12.260	12.291	12.322	12.353	12.384	12.416	12.447	12.478	12.509	12.540	12.572	490
500	12.572	12.603	12.634	12.666	12.697	12.728	12.760	12.791	12.822	12.854	12.885	500
510	12.885	12.917	12.948	12.979	13.011	13.042	13.074	13.105	13.137	13.168	13.200	510
520	13.200	13.232	13.263	13.295	13.326	13.358	13.390	13.421	13.453	13.485	13.516	520
530	13.516	13.548	13.580	13.611	13.643	13.675	13.707	13.739	13.770	13.802	13.834	530
540	13.834	13.866	13.898	13.930	13.961	13.993	14.025	14.057	14.089	14.121	14.153	540
550	14.153	14.185	14.217	14.249	14.281	14.313	14.345	14.377	14.409	14.441	14.474	550
560	14.474	14.506	14.538	14.570	14.602	14.634	14.666	14.699	14.731	14.763	14.795	560
570	14.795	14.828	14.860	14.892	14.924	14.957	14.989	15.021	15.054	15.086	15.118	570
580	15.118	15.151	15.183	15.216	15.248	15.280	15.313	15.345	15.378	15.410	15.443	580
590	15.443	15.475	15.508	15.540	15.573	15.605	15.638	15.671	15.703	15.736	15.769	590
600	15.769	15.801	15.834	15.866	15.899	15.932	15.965	15.997	16.030	16.063	16.096	600
610	16.096	16.128	16.161	16.194	16.227	16.259	16.292	16.325	16.358	16.391	16.424	610
620	16.424	16.457	16.490	16.523	16.556	16.588	16.621	16.654	16.687	16.720	16.753	620
630	16.753	16.786	16.819	16.852	16.886	16.919	16.952	16.985	17.018	17.051	17.084	630
640	17.084	17.117	17.150	17.184	17.217	17.250	17.283	17.316	17.350	17.383	17.416	640
650	17.416	17.450	17.483	17.516	17.549	17.583	17.616	17.649	17.683	17.716	17.750	650
660	17.750	17.783	17.816	17.850	17.883	17.917	17.950	17.984	18.017	18.051	18.084	660
670	18.084	18.118	18.151	18.185	18.218	18.252	18.285	18.319	18.353	18.386	18.420	670
680	18.420	18.454	18.487	18.521	18.555	18.588	18.622	18.656	18.689	18.723	18.757	680
690	18.757	18.791	18.824	18.858	18.892	18.926	18.960	18.993	19.027	19.061	19.095	690
700	19.095	19.129	19.163	19.197	19.230	19.264	19.298	19.332	19.366	19.400	19.434	700
710	19.434	19.468	19.502	19.536	19.570	19.604	19.638	19.672	19.706	19.740	19.774	710
720	19.774	19.808	19.843	19.877	19.911	19.945	19.979	20.013	20.047	20.081	20.116	720
730	20.116	20.150	20.184	20.218	20.252	20.287	20.321	20.355	20.389	20.423	20.458	730
740	20.458	20.492	20.526	20.560	20.595	20.629	20.663	20.698	20.732	20.766	20.801	740
750	20.801	20.835	20.869									750
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F

* Converted from degrees Celsius (IPTS 1968).

TABLE 16 Type T Thermocouples
Temperature in Degrees Celsius (IPTS 1968)

EMF in Absolute Millivolts

Reference Junctions at 0 C

DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
-270	-6.258											-270
-260	-6.232	-6.236	-6.239	-6.242	-6.245	-6.248	-6.251	-6.253	-6.255	-6.256	-6.258	-260
-250	-6.181	-6.187	-6.193	-6.198	-6.204	-6.209	-6.214	-6.219	-6.224	-6.228	-6.232	-250
-240	-6.105	-6.114	-6.122	-6.130	-6.138	-6.146	-6.153	-6.160	-6.167	-6.174	-6.181	-240
-230	-6.007	-6.018	-6.028	-6.039	-6.049	-6.059	-6.068	-6.078	-6.087	-6.096	-6.105	-230
-220	-5.889	-5.901	-5.914	-5.926	-5.938	-5.950	-5.962	-5.973	-5.985	-5.996	-6.007	-220
-210	-5.753	-5.767	-5.782	-5.795	-5.809	-5.823	-5.836	-5.850	-5.863	-5.876	-5.889	-210
-200	-5.603	-5.619	-5.634	-5.650	-5.665	-5.680	-5.695	-5.710	-5.724	-5.739	-5.753	-200
-190	-5.439	-5.456	-5.473	-5.489	-5.506	-5.522	-5.539	-5.555	-5.571	-5.587	-5.603	-190
-180	-5.261	-5.279	-5.297	-5.315	-5.333	-5.351	-5.369	-5.387	-5.404	-5.421	-5.439	-180
-170	-5.069	-5.089	-5.109	-5.128	-5.147	-5.167	-5.186	-5.205	-5.223	-5.242	-5.261	-170
-160	-4.865	-4.886	-4.907	-4.928	-4.948	-4.969	-4.989	-5.010	-5.030	-5.050	-5.069	-160
-150	-4.648	-4.670	-4.693	-4.715	-4.737	-4.758	-4.780	-4.801	-4.823	-4.844	-4.865	-150
-140	-4.419	-4.442	-4.466	-4.489	-4.512	-4.535	-4.558	-4.581	-4.603	-4.626	-4.648	-140
-130	-4.177	-4.202	-4.226	-4.251	-4.275	-4.299	-4.323	-4.347	-4.371	-4.395	-4.419	-130
-120	-3.923	-3.949	-3.974	-4.000	-4.026	-4.051	-4.077	-4.102	-4.127	-4.152	-4.177	-120
-110	-3.656	-3.684	-3.711	-3.737	-3.764	-3.791	-3.818	-3.844	-3.870	-3.897	-3.923	-110
-100	-3.378	-3.407	-3.435	-3.463	-3.491	-3.519	-3.547	-3.574	-3.602	-3.629	-3.656	-100
-90	-3.089	-3.118	-3.147	-3.177	-3.206	-3.235	-3.264	-3.293	-3.321	-3.350	-3.378	-90
-80	-2.788	-2.818	-2.849	-2.879	-2.909	-2.939	-2.970	-2.999	-3.029	-3.059	-3.089	-80
-70	-2.475	-2.507	-2.539	-2.570	-2.602	-2.633	-2.664	-2.695	-2.726	-2.757	-2.788	-70
-60	-2.152	-2.185	-2.218	-2.250	-2.283	-2.315	-2.348	-2.380	-2.412	-2.444	-2.475	-60
-50	-1.819	-1.853	-1.886	-1.920	-1.953	-1.987	-2.020	-2.053	-2.087	-2.120	-2.152	-50
-40	-1.475	-1.510	-1.544	-1.579	-1.614	-1.648	-1.682	-1.717	-1.751	-1.785	-1.819	-40
-30	-1.121	-1.157	-1.192	-1.227	-1.263	-1.299	-1.334	-1.370	-1.405	-1.440	-1.475	-30
-20	-0.757	-0.794	-0.830	-0.867	-0.903	-0.940	-0.976	-1.013	-1.049	-1.085	-1.121	-20
-10	-0.383	-0.421	-0.458	-0.496	-0.534	-0.571	-0.608	-0.646	-0.683	-0.720	-0.757	-10
0	0.000	-0.039	-0.077	-0.116	-0.154	-0.193	-0.231	-0.269	-0.307	-0.345	-0.383	0
0	0.000	0.039	0.078	0.117	0.156	0.195	0.234	0.273	0.312	0.351	0.391	0
10	0.391	0.430	0.470	0.510	0.549	0.589	0.629	0.669	0.709	0.749	0.789	10
20	0.789	0.830	0.870	0.911	0.951	0.992	1.032	1.073	1.114	1.155	1.196	20
30	1.196	1.237	1.279	1.320	1.361	1.403	1.444	1.486	1.528	1.569	1.611	30
40	1.611	1.653	1.695	1.738	1.780	1.822	1.865	1.907	1.950	1.992	2.035	40
50	2.035	2.078	2.121	2.164	2.207	2.250	2.294	2.337	2.380	2.424	2.467	50
60	2.467	2.511	2.555	2.599	2.643	2.687	2.731	2.775	2.819	2.864	2.908	60
70	2.908	2.953	2.997	3.042	3.087	3.131	3.176	3.221	3.266	3.312	3.357	70
80	3.357	3.402	3.447	3.493	3.538	3.584	3.630	3.676	3.721	3.767	3.813	80
90	3.813	3.859	3.906	3.952	3.998	4.044	4.091	4.137	4.184	4.231	4.277	90
100	4.277	4.324	4.371	4.418	4.465	4.512	4.559	4.607	4.654	4.701	4.749	100
110	4.749	4.796	4.844	4.891	4.939	4.987	5.035	5.083	5.131	5.179	5.227	110
120	5.227	5.275	5.324	5.372	5.420	5.469	5.517	5.566	5.615	5.663	5.712	120
130	5.712	5.761	5.810	5.859	5.908	5.957	6.007	6.056	6.105	6.155	6.204	130
140	6.204	6.254	6.303	6.353	6.403	6.452	6.502	6.552	6.602	6.652	6.702	140
150	6.702	6.753	6.803	6.853	6.903	6.954	7.004	7.055	7.106	7.156	7.207	150
160	7.207	7.258	7.309	7.360	7.411	7.462	7.513	7.564	7.615	7.666	7.718	160
170	7.718	7.769	7.821	7.872	7.924	7.975	8.027	8.079	8.131	8.183	8.235	170
180	8.235	8.287	8.339	8.391	8.443	8.495	8.548	8.600	8.652	8.705	8.757	180
190	8.757	8.810	8.863	8.915	8.968	9.021	9.074	9.127	9.180	9.233	9.286	190
200	9.286	9.339	9.392	9.446	9.499	9.553	9.606	9.659	9.713	9.767	9.820	200
210	9.820	9.874	9.928	9.982	10.036	10.090	10.144	10.198	10.252	10.306	10.360	210
220	10.360	10.414	10.469	10.523	10.578	10.632	10.687	10.741	10.796	10.851	10.905	220
230	10.905	10.960	11.015	11.070	11.125	11.180	11.235	11.290	11.345	11.401	11.456	230
240	11.456	11.511	11.566	11.622	11.677	11.733	11.788	11.844	11.900	11.956	12.011	240
250	12.011	12.067	12.123	12.179	12.235	12.291	12.347	12.403	12.459	12.515	12.572	250
260	12.572	12.628	12.684	12.741	12.797	12.854	12.910	12.967	13.024	13.080	13.137	260
270	13.137	13.194	13.251	13.307	13.364	13.421	13.478	13.535	13.592	13.650	13.707	270
280	13.707	13.764	13.821	13.879	13.936	13.993	14.051	14.108	14.166	14.223	14.281	280
290	14.281	14.339	14.396	14.454	14.512	14.570	14.628	14.686	14.744	14.802	14.860	290
300	14.860	14.918	14.976	15.034	15.092	15.151	15.209	15.267	15.326	15.384	15.443	300
310	15.443	15.501	15.560	15.619	15.677	15.736	15.795	15.853	15.912	15.971	16.030	310
320	16.030	16.089	16.148	16.207	16.266	16.325	16.384	16.444	16.503	16.562	16.621	320
330	16.621	16.681	16.740	16.800	16.859	16.919	16.978	17.038	17.097	17.157	17.217	330
340	17.217	17.277	17.336	17.396	17.456	17.516	17.576	17.636	17.696	17.756	17.816	340
DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C

TABLE 16 Type T Thermocouples *Continued*
 Temperature in Degrees Celsius (IPTS 1968)

EMF in Absolute Millivolts

Reference Junctions at 0 C

DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C
THERMOELECTRIC VOLTAGE IN ABSOLUTE MILLIVOLTS												
350	17.816	17.877	17.937	17.997	18.057	18.118	18.178	18.238	18.299	18.359	18.420	350
360	18.420	18.480	18.541	18.602	18.662	18.723	18.784	18.845	18.905	18.966	19.027	360
370	19.027	19.088	19.149	19.210	19.271	19.332	19.393	19.455	19.516	19.577	19.638	370
380	19.638	19.699	19.761	19.822	19.883	19.945	20.006	20.068	20.129	20.191	20.252	380
390	20.252	20.314	20.376	20.437	20.499	20.560	20.622	20.684	20.746	20.807	20.869	390
400	20.869											400
DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C

U.S. THERMOCOUPLE WIRE COLOR CODING

T/C TYPE	PLUS (+)	MINUS (-)
B	Green	Red
E	Purple	Red
J	White	Red
K	Yellow	Red
R,S	Black	Red
T	Blue	Red

TABLE 17 100 Ohm Platinum RTD
DIN 43760 (10/80) Curve

Resistance in Ohms												Temperature in Degrees Fahrenheit	
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F	
-210	46.167	45.937	45.708	45.478	45.249	45.019	44.789	44.559	44.329	44.099	43.869	-210	
-200	48.457	48.228	47.999	47.770	47.542	47.313	47.084	46.854	46.625	46.396	46.167	-200	
-190	50.739	50.512	50.283	50.055	49.827	49.599	49.371	49.142	48.914	48.685	48.457	-190	
-180	53.015	52.788	52.561	52.333	52.106	51.878	51.651	51.423	51.195	50.967	50.739	-180	
-170	55.284	55.058	54.831	54.604	54.378	54.151	53.924	53.697	53.470	53.243	53.015	-170	
-160	57.547	57.321	57.095	56.869	56.643	56.417	56.190	55.964	55.738	55.511	55.284	-160	
-150	59.804	59.578	59.353	59.127	58.902	58.676	58.450	58.225	57.999	57.773	57.547	-150	
-140	62.054	61.829	61.604	61.379	61.155	60.930	60.704	60.479	60.254	60.029	59.804	-140	
-130	64.299	64.074	63.850	63.626	63.401	63.177	62.953	62.728	62.503	62.279	62.054	-130	
-120	66.538	66.314	66.090	65.867	65.643	65.419	65.195	64.971	64.747	64.523	64.299	-120	
-110	68.771	68.548	68.325	68.102	67.879	67.655	67.432	67.208	66.985	66.761	66.538	-110	
-100	71.000	70.777	70.555	70.332	70.109	69.886	69.663	69.441	69.218	68.995	68.771	-100	
-90	73.223	73.001	72.779	72.557	72.335	72.112	71.890	71.668	71.445	71.223	71.000	-90	
-80	75.442	75.220	74.999	74.777	74.555	74.333	74.111	73.890	73.668	73.446	73.223	-80	
-70	77.656	77.435	77.214	76.992	76.771	76.550	76.328	76.107	75.885	75.664	75.442	-70	
-60	79.865	79.645	79.424	79.203	78.982	78.761	78.540	78.319	78.098	77.877	77.656	-60	
-50	82.071	81.850	81.630	81.409	81.189	80.969	80.748	80.527	80.307	80.086	79.865	-50	
-40	84.271	84.051	83.831	83.611	83.391	83.171	82.951	82.731	82.511	82.291	82.071	-40	
-30	86.468	86.248	86.029	85.809	85.590	85.370	85.150	84.931	84.711	84.491	84.271	-30	
-20	88.660	88.441	88.222	88.003	87.784	87.565	87.345	87.126	86.907	86.687	86.468	-20	
-10	90.849	90.630	90.412	90.193	89.974	89.755	89.536	89.317	89.098	88.879	88.660	-10	
0	93.034	92.815	92.597	92.379	92.160	91.942	91.723	91.505	91.286	91.068	90.849	0	
0	93.034	93.252	93.470	93.688	93.907	94.125	94.343	94.561	94.779	94.997	95.215	0	
10	95.215	95.433	95.651	95.868	96.086	96.304	96.522	96.739	96.957	97.175	97.392	10	
20	97.392	97.610	97.827	98.045	98.262	98.479	98.697	98.914	99.131	99.349	99.566	20	
30	99.566	99.783	100.000	100.217	100.434	100.651	100.868	101.085	101.302	101.519	101.736	30	
40	101.736	101.953	102.169	102.386	102.603	102.819	103.036	103.253	103.469	103.686	103.902	40	
50	103.902	104.119	104.335	104.551	104.768	104.984	105.200	105.417	105.633	105.849	106.065	50	
60	106.065	106.281	106.497	106.713	106.929	107.145	107.361	107.577	107.793	108.009	108.224	60	
70	108.224	108.440	108.656	108.872	109.087	109.303	109.518	109.734	109.949	110.165	110.380	70	
80	110.380	110.596	110.811	111.026	111.241	111.457	111.672	111.887	112.102	112.317	112.532	80	
90	112.532	112.747	112.962	113.177	113.392	113.607	113.822	114.037	114.251	114.466	114.681	90	
100	114.681	114.895	115.110	115.325	115.539	115.754	115.968	116.183	116.397	116.611	116.826	100	
110	116.826	117.040	117.254	117.469	117.683	117.897	118.111	118.325	118.539	118.753	118.967	110	
120	118.967	119.181	119.395	119.609	119.823	120.037	120.250	120.464	120.678	120.891	121.105	120	
130	121.105	121.319	121.532	121.746	121.959	122.173	122.386	122.599	122.813	123.026	123.239	130	
140	123.239	123.452	123.666	123.879	124.092	124.305	124.518	124.731	124.944	125.157	125.370	140	
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F	

NOTE: DIN IEC 751 curve is identical to
DIN 43760 (10/80) curve

TABLE 17 100 Ohm Platinum RTD *Continued*
DIN 43760 (10/80) Curve

Resistance in Ohms												Temperature in Degrees Fahrenheit	
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F	
150	125.370	125.583	125.796	126.008	126.221	126.434	126.647	126.859	127.072	127.284	127.497	150	
160	127.497	127.709	127.922	128.134	128.347	128.559	128.771	128.984	129.196	129.408	129.620	160	
170	129.620	129.833	130.045	130.257	130.469	130.681	130.893	131.105	131.317	131.529	131.740	170	
180	131.740	131.952	132.164	132.376	132.587	132.799	133.011	133.222	133.434	133.645	133.857	180	
190	133.857	134.068	134.280	134.491	134.702	134.914	135.125	135.336	135.547	135.758	135.969	190	
200	135.969	136.181	136.392	136.603	136.814	137.024	137.235	137.446	137.657	137.868	138.079	200	
210	138.079	138.289	138.500	138.711	138.921	139.132	139.342	139.553	139.763	139.974	140.184	210	
220	140.184	140.395	140.605	140.815	141.025	141.236	141.446	141.656	141.866	142.076	142.286	220	
230	142.286	142.496	142.706	142.916	143.126	143.336	143.546	143.755	143.965	144.175	144.385	230	
240	144.385	144.595	144.804	145.013	145.223	145.432	145.642	145.851	146.061	146.270	146.479	240	
250	146.479	146.689	146.898	147.107	147.316	147.526	147.735	147.944	148.153	148.362	148.571	250	
260	148.571	148.780	148.989	149.197	149.406	149.615	149.824	150.032	150.241	150.450	150.658	260	
270	150.658	150.867	151.075	151.284	151.492	151.701	151.909	152.118	152.326	152.534	152.742	270	
280	152.742	152.951	153.159	153.367	153.575	153.783	153.991	154.199	154.407	154.615	154.823	280	
290	154.823	155.031	155.239	155.446	155.654	155.862	156.070	156.277	156.485	156.692	156.900	290	
300	156.900	157.107	157.315	157.522	157.730	157.937	158.144	158.352	158.559	158.766	158.973	300	
310	158.973	159.180	159.387	159.595	159.802	160.009	160.216	160.422	160.629	160.836	161.043	310	
320	161.043	161.250	161.457	161.663	161.870	162.077	162.283	162.490	162.696	162.903	163.109	320	
330	163.109	163.316	163.522	163.728	163.935	164.141	164.347	164.553	164.760	164.966	165.172	330	
340	165.172	165.378	165.584	165.790	165.996	166.202	166.408	166.614	166.819	167.025	167.231	340	
350	167.231	167.437	167.642	167.848	168.053	168.259	168.465	168.670	168.875	169.081	169.286	350	
360	169.286	169.492	169.697	169.902	170.107	170.313	170.518	170.723	170.928	171.133	171.338	360	
370	171.338	171.543	171.748	171.953	172.158	172.363	172.568	172.772	172.977	173.182	173.386	370	
380	173.386	173.591	173.796	174.000	174.205	174.409	174.614	174.818	175.022	175.227	175.431	380	
390	175.431	175.635	175.840	176.044	176.248	176.452	176.656	176.860	177.064	177.268	177.472	390	
400	177.472	177.676	177.880	178.084	178.288	178.491	178.695	178.899	179.103	179.306	179.510	400	
410	179.510	179.713	179.917	180.120	180.324	180.527	180.731	180.934	181.137	181.340	181.544	410	
420	181.544	181.747	181.950	182.153	182.356	182.559	182.762	182.965	183.168	183.371	183.574	420	
430	183.574	183.777	183.980	184.182	184.385	184.588	184.791	184.993	185.196	185.398	185.601	430	
440	185.601	185.803	186.006	186.208	186.411	186.613	186.815	187.017	187.220	187.422	187.624	440	
450	187.624	187.826	188.028	188.230	188.432	188.634	188.836	189.038	189.240	189.442	189.644	450	
460	189.644	189.845	190.047	190.249	190.451	190.652	190.854	191.055	191.257	191.458	191.660	460	
470	191.660	191.861	192.063	192.264	192.465	192.666	192.868	193.069	193.270	193.471	193.672	470	
480	193.672	193.873	194.074	194.275	194.476	194.677	194.878	195.079	195.280	195.480	195.681	480	
490	195.681	195.882	196.082	196.283	196.484	196.684	196.885	197.085	197.286	197.486	197.686	490	
500	197.686	197.887	198.087	198.287	198.487	198.688	198.888	199.088	199.288	199.488	199.688	500	
510	199.688	199.888	200.088	200.288	200.488	200.688	200.887	201.087	201.287	201.487	201.686	510	
520	201.686	201.886	202.085	202.285	202.484	202.684	202.883	203.083	203.282	203.481	203.681	520	
530	203.681	203.880	204.079	204.278	204.478	204.677	204.876	205.075	205.274	205.473	205.672	530	
540	205.672	205.871	206.070	206.268	206.467	206.666	206.865	207.063	207.262	207.461	207.659	540	
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F	

TABLE 17 100 Ohm Platinum RTD Continued
DIN 43760 (10/80) Curve

Resistance in Ohms												Temperature in Degrees Fahrenheit	
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F	
550	207.659	207.858	208.056	208.255	208.453	208.651	208.850	209.048	209.246	209.445	209.643	550	
560	209.643	209.841	210.039	210.237	210.435	210.634	210.832	211.029	211.227	211.425	211.623	560	
570	211.623	211.821	212.019	212.217	212.414	212.612	212.810	213.007	213.205	213.402	213.600	570	
580	213.600	213.797	213.995	214.192	214.390	214.587	214.784	214.981	215.179	215.376	215.573	580	
590	215.573	215.770	215.967	216.164	216.361	216.558	216.755	216.952	217.149	217.346	217.542	590	
600	217.542	217.739	217.936	218.133	218.329	218.526	218.722	218.919	219.115	219.312	219.508	600	
610	219.508	219.705	219.901	220.097	220.294	220.490	220.686	220.882	221.078	221.275	221.471	610	
620	221.471	221.667	221.863	222.059	222.255	222.450	222.646	222.842	223.038	223.234	223.429	620	
630	223.429	223.625	223.821	224.016	224.212	224.407	224.603	224.798	225.994	225.189	225.385	630	
640	225.385	225.580	225.775	225.970	226.166	226.361	226.556	226.751	226.946	227.141	227.336	640	
650	227.336	227.531	227.726	227.921	228.116	228.311	228.505	228.700	228.895	229.089	229.284	650	
660	229.284	229.479	229.673	229.868	230.062	230.257	230.451	230.646	230.840	231.034	231.228	660	
670	231.228	231.423	231.617	231.811	232.005	232.199	232.393	232.587	232.781	232.975	233.169	670	
680	233.169	233.363	233.557	233.751	233.945	234.138	234.332	234.526	234.719	234.913	235.107	680	
690	235.107	235.300	235.494	235.687	235.880	235.074	236.267	236.461	236.654	236.847	237.040	690	
700	237.040	237.233	237.427	237.620	237.813	238.006	238.199	238.392	238.585	238.777	238.970	700	
710	238.970	239.163	239.356	239.549	239.741	239.934	240.127	240.319	240.512	240.704	240.897	710	
720	240.897	241.089	241.282	241.474	241.666	241.859	242.051	242.243	242.435	242.628	242.820	720	
730	242.820	242.012	243.204	243.396	243.588	243.780	243.972	244.164	244.356	244.547	244.739	730	
740	244.739	244.931	245.123	245.314	245.506	245.697	245.889	246.081	246.272	246.463	246.655	740	
750	246.655	246.846	247.038	247.229	247.420	247.611	247.803	247.994	248.185	248.376	248.567	750	
760	248.567	248.758	248.949	249.140	249.331	249.522	249.713	249.903	250.094	250.285	250.476	760	
770	250.476	250.666	250.857	251.048	251.238	251.429	251.619	251.810	252.000	252.190	252.381	770	
780	252.381	252.571	252.761	252.951	253.142	253.332	253.522	253.712	253.902	254.092	254.282	780	
790	254.282	254.472	254.662	254.852	255.042	255.231	255.421	255.611	255.801	255.990	256.180	790	
800	256.180	256.370	256.559	256.749	256.938	257.128	257.317	257.506	257.696	257.885	258.074	800	
810	258.074	258.263	258.453	258.642	258.831	259.020	259.209	259.398	259.587	259.776	259.965	810	
820	259.965	260.154	260.343	260.531	260.720	260.909	261.098	261.286	261.475	261.664	261.852	820	
830	261.852	262.041	262.229	262.417	262.606	262.794	263.983	263.171	263.359	263.547	263.736	830	
840	263.736	263.924	264.112	264.300	264.488	264.676	264.864	265.052	265.240	265.428	265.616	840	
850	265.616	265.803	266.991	266.179	266.367	266.554	266.742	266.929	267.117	267.304	267.492	850	
860	267.492	267.679	267.867	268.054	268.241	268.429	268.616	268.803	268.990	269.178	269.365	860	
870	269.365	269.552	269.739	269.926	270.113	270.300	270.487	270.674	270.860	271.047	271.234	870	
880	271.234	271.421	271.607	271.794	272.981	272.167	272.354	272.540	272.727	272.913	273.099	880	
890	273.099	273.286	273.472	273.658	273.845	274.031	274.217	274.403	274.589	274.776	274.962	890	
900	274.962	275.148	275.334	275.519	275.705	275.891	276.077	276.263	276.449	276.634	276.820	900	
910	276.820	277.006	277.191	277.377	277.562	277.748	277.933	278.119	278.304	278.490	278.675	910	
920	278.675	278.860	279.045	279.231	279.416	279.601	279.786	279.971	280.156	280.341	280.526	920	
930	280.526	280.711	280.896	281.081	281.266	281.450	281.635	281.820	282.005	282.189	282.374	930	
940	282.374	282.558	282.743	282.928	283.112	283.296	283.481	283.665	283.849	284.034	284.218	940	
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F	

TABLE 17 100 Ohm Platinum RTD *Continued*
DIN 43760 (10/80) Curve

Resistance in Ohms											Temperature in Degrees Fahrenheit	
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F
950	284.218	284.402	284.586	284.771	284.955	285.139	285.323	285.507	285.691	285.875	286.059	950
960	286.059	286.242	286.426	286.610	286.794	286.978	287.161	287.345	287.528	287.712	287.896	960
970	287.896	288.079	288.263	288.446	288.629	288.813	289.996	289.179	289.363	289.546	289.729	970
980	289.729	289.912	290.095	290.278	290.461	290.644	290.827	291.010	291.193	291.376	291.559	980
990	291.559	291.742	291.924	292.107	292.290	292.472	292.655	292.837	293.020	293.203	293.385	990
1000	293.385	293.567	293.750	293.932	294.114	294.297	294.479	294.661	294.843	295.026	295.208	1000
1010	295.208	295.390	295.572	295.754	295.936	296.118	296.299	296.481	296.663	296.845	297.027	1010
1020	297.027	297.208	297.390	297.572	297.753	297.935	298.116	298.298	298.479	298.661	298.842	1020
1030	298.842	299.024	299.205	299.386	299.567	299.749	299.930	300.111	300.292	300.473	300.654	1030
1040	300.654	300.835	301.016	301.197	301.378	301.559	301.740	301.920	302.101	302.282	302.462	1040
1050	302.462	302.643	302.824	303.004	303.185	303.365	303.546	303.726	303.906	304.087	304.267	1050
1060	304.267	304.447	304.628	304.808	304.988	305.168	305.348	305.528	305.708	305.888	306.068	1060
1070	306.068	306.248	306.428	306.608	306.788	306.967	307.147	307.327	307.507	307.686	307.866	1070
1080	307.866	308.045	308.225	308.404	308.584	308.763	308.943	309.122	309.301	309.481	309.660	1080
1090	309.660	309.839	310.018	310.197	310.376	310.555	310.735	310.914	311.092	311.271	311.450	1090
1100	311.450	311.629	311.808	311.987	312.165	312.344	312.523	312.701	312.880	313.059	313.237	1100
1110	313.237	313.416	313.594	313.772	313.951	314.129	314.307	314.486	314.664	314.842	315.020	1110
1120	315.020	315.198	315.377	315.555	315.733	315.911	316.089	316.266	316.444	316.622	316.800	1120
1130	316.800	316.978	317.156	317.333	317.511	317.688	317.866	318.044	318.221	318.399	318.576	1130
1140	318.576	318.753	318.931	319.108	319.286	319.463	319.640	319.817	319.994	320.171	320.349	1140
1150	320.349	320.526	320.703	320.880	321.057	321.233	321.410	321.587	321.764	321.941	322.118	1150
1160	322.118	322.294	322.471	322.647	322.824	323.001	323.177	323.354	323.530	323.706	323.883	1160
1170	323.883	324.059	324.235	324.412	324.588	324.764	324.940	325.116	325.293	325.469	325.645	1170
1180	325.645	325.821	325.997	326.172	326.348	326.524	326.700	326.876	327.051	327.227	327.403	1180
1190	327.403	327.578	327.754	327.930	328.105	328.281	328.456	328.631	328.807	328.982	329.157	1190
1200	329.157	329.333	329.508	329.683	329.858	330.033	330.208	330.383	330.558	330.733	330.908	1200
1210	330.908	331.083	331.258	331.433	331.608	331.783	331.957	332.132	332.307	332.481	332.656	1210
1220	332.656	332.830	333.005	333.179	333.354	333.528	333.703	333.877	334.051	334.225	334.400	1220
1230	334.400	334.574	334.748	334.922	335.096	335.270	335.444	335.618	335.792	335.966	336.140	1230
1240	336.140	336.314	336.488	336.661	336.835	337.009	337.182	337.356	337.530	337.703	337.877	1240
1250	337.877	338.050	338.224	338.397	338.570	338.744	338.917	339.090	339.263	339.437	339.610	1250
1260	339.610	339.783	339.956	340.129	340.302	340.475	340.648	340.821	340.994	341.166	341.339	1260
1270	341.339	341.512	341.685	341.857	342.030	342.203	342.375	342.548	342.720	342.893	343.065	1270
1280	343.065	343.238	343.410	343.582	343.755	343.927	344.099	344.271	344.443	344.615	344.788	1280
1290	344.788	344.960	345.132	345.304	345.476	345.647	345.819	345.991	346.163	346.335	346.506	1290
1300	346.506	346.678	346.850	347.021	347.193	347.364	347.536	347.707	347.879	348.050	348.222	1300
1310	348.222	348.393	348.564	348.735	348.907	349.078	349.249	349.420	349.591	349.762	349.933	1310
1320	349.933	350.104	350.275	350.446	350.617	350.788	350.958	351.129	351.300	351.471	351.641	1320
1330	351.641	351.812	352.982	352.153	352.323	352.494	352.664	352.835	353.005	353.175	353.346	1330
1340	353.346	353.516	353.686	353.856	354.026	354.197	354.367	354.537	354.707	354.877	355.047	1340
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F

TABLE 17 100 Ohm Platinum RTD *Continued*
DIN 43760 (10/80) Curve

Resistance in Ohms												Temperature in Degrees Fahrenheit	
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F	
1350	355.047	355.216	355.386	355.556	355.726	355.896	356.065	356.235	356.405	356.574	356.744	1350	
1360	356.744	356.913	357.083	357.252	357.422	357.591	357.760	357.930	358.099	358.268	358.438	1360	
1370	358.438	358.607	358.776	358.945	359.114	359.283	359.452	359.621	359.790	359.959	360.128	1370	
1380	360.128	360.296	360.465	360.634	360.803	360.971	361.140	361.309	361.477	361.646	361.814	1380	
1390	361.814	362.983	362.151	362.319	362.488	362.656	362.824	362.993	363.161	363.329	363.497	1390	
1400	363.497	363.665	363.833	364.001	364.169	364.337	364.505	364.673	364.841	365.009	365.177	1400	
1410	365.177	365.344	365.512	365.680	365.847	366.015	366.182	366.350	366.517	366.685	366.852	1410	
1420	366.852	367.020	367.187	367.354	367.522	367.689	367.856	368.023	368.190	368.358	368.525	1420	
1430	368.525	368.692	368.859	369.026	369.192	369.359	369.526	369.693	369.860	370.027	370.193	1430	
1440	370.193	370.360	370.527	370.693	370.860	371.026	371.193	371.359	371.526	371.692	371.858	1440	
1450	371.858	372.025	372.191	372.357	372.523	372.689	372.856	373.022	373.188	373.354	373.520	1450	
1460	373.520	373.686	373.852	374.018	374.183	374.349	374.515	374.681	374.846	375.012	375.178	1460	
1470	375.178	375.343	375.509	375.674	375.840	376.005	376.171	376.336	376.501	376.667	376.832	1470	
1480	376.832	376.997	377.162	377.328	377.493	377.658	377.823	377.988	378.153	378.318	378.483	1480	
1490	378.483	378.648	378.812	378.977	379.142	379.307	379.471	379.636	379.801	380.965	380.130	1490	
1500	380.130	380.294	380.459	380.623	380.788	381.952	381.116	381.281	381.445	381.609	381.773	1500	
1510	381.773	382.938	382.102	382.266	382.430	382.594	382.758	383.922	383.086	383.250	383.413	1510	
1520	383.413	383.577	383.741	383.905	384.068	384.232	384.396	384.559	384.723	384.886	385.050	1520	
1530	385.050	385.213	385.377	385.540	385.703	385.867	386.030	386.193	386.356	386.520	386.683	1530	
1540	386.683	386.846	387.009	387.172	387.335	387.498	387.661	387.823	387.986	388.149	388.312	1540	
1550	388.312	388.475	388.637	388.800	388.963	389.125	389.288	389.450	389.613	389.775	389.938	1550	
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F	

TABLE 18 100 Ohm Platinum RTD
DIN 43760 (10/80) Curve

Resistance in Ohms Temperature in Degrees Celsius

DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C
-210	14.146	13.709	13.272	12.834	12.396	11.958	11.519	11.080	10.640	10.200	9.759	-210
-200	18.493	18.060	17.627	17.193	16.759	16.324	15.889	15.454	15.019	14.582	14.146	-200
-190	22.803	22.374	21.944	21.514	21.083	20.653	20.221	19.790	19.358	18.926	18.493	-190
-180	27.078	26.652	26.226	25.799	25.372	24.945	24.517	24.089	23.661	23.232	22.803	-180
-170	31.320	30.897	30.474	30.051	29.627	29.203	28.779	28.354	27.929	27.504	27.078	-170
-160	35.531	35.111	34.691	34.271	33.850	33.429	33.008	32.587	32.165	31.742	31.320	-160
-150	39.714	39.297	38.879	38.462	38.044	37.626	37.208	36.789	36.370	35.951	35.531	-150
-140	43.869	43.455	43.040	42.625	42.210	41.795	41.379	40.963	40.547	40.130	39.714	-140
-130	47.999	47.587	47.175	46.763	46.350	45.937	45.524	45.111	44.697	44.283	43.869	-130
-120	52.106	51.696	51.286	50.876	50.466	50.055	49.645	49.234	48.822	48.411	47.999	-120
-110	56.190	55.783	55.375	54.967	54.559	54.151	53.742	53.333	52.924	52.515	52.106	-110
-100	60.254	59.849	59.443	59.037	58.631	58.225	57.818	57.412	57.005	56.598	56.190	-100
-90	64.299	63.895	63.491	63.087	62.683	62.279	61.874	61.469	61.065	60.659	60.254	-90
-80	68.325	67.923	67.521	67.119	66.717	66.314	65.911	65.508	65.105	64.702	64.299	-80
-70	72.335	71.934	71.534	71.134	70.733	70.332	69.931	69.530	69.128	68.727	68.325	-70
-60	76.328	75.930	75.531	75.132	74.733	74.333	73.934	73.534	73.135	72.735	72.335	-60
-50	80.307	79.910	79.512	79.115	78.717	78.319	77.921	77.523	77.125	76.727	76.328	-50
-40	84.271	83.875	83.479	83.083	82.687	82.291	81.894	81.498	81.101	80.704	80.307	-40
-30	88.222	87.828	87.433	87.038	86.643	86.248	85.853	85.458	85.063	84.667	84.271	-30
-20	92.160	91.767	91.374	90.980	90.587	90.193	89.799	89.405	89.011	88.617	88.222	-20
-10	96.086	95.694	95.302	94.910	94.517	94.125	93.732	93.339	92.946	92.553	92.160	-10
0	100.000	99.609	99.218	98.827	98.436	98.045	97.653	97.262	96.870	96.478	96.086	0
10	103.902	104.292	104.681	105.071	105.460	105.849	106.238	106.627	107.016	107.404	107.793	10
20	107.793	108.181	108.570	108.958	109.346	109.734	110.122	110.509	110.897	111.284	111.672	20
30	111.672	112.059	112.446	112.833	113.220	113.607	113.994	114.380	114.767	115.153	115.539	30
40	115.539	115.925	116.311	116.697	117.083	117.469	117.854	118.240	118.625	119.010	119.395	40
50	119.395	119.780	120.165	120.550	120.934	121.319	121.703	122.087	122.471	122.855	123.239	50
60	123.239	123.623	124.007	124.390	124.774	125.157	125.540	125.923	126.306	126.689	127.072	60
70	127.072	127.454	127.837	128.219	128.602	128.984	129.366	129.748	130.130	130.511	130.893	70
80	130.893	131.274	131.656	132.037	132.418	132.799	133.180	133.561	133.941	134.322	134.702	80
90	134.702	135.083	135.463	135.843	136.223	136.603	136.982	137.362	137.741	138.121	138.500	90
100	138.500	138.879	139.258	139.637	140.016	140.395	140.773	141.152	141.530	141.908	142.286	100
110	142.286	142.664	143.042	143.420	143.797	144.175	144.552	144.930	145.307	145.684	146.061	110
120	146.061	146.438	146.814	147.191	147.567	147.944	148.320	148.696	149.072	149.448	149.824	120
130	149.824	150.199	150.575	150.950	151.326	151.701	152.076	152.451	152.826	153.200	153.575	130
140	153.575	153.950	154.324	154.698	155.072	155.446	155.820	156.194	156.568	156.941	157.315	140

DEG C 0 1 2 3 4 5 6 7 8 9 10 DEG C

NOTE: DIN IEC 751 curve is identical to
DIN 43760 (10/80) curve

TABLE 18 100 Ohm Platinum RTD Continued
DIN 43760 (10/80) Curve

Resistance in Ohms												Temperature in Degrees Celsius	
DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C	
150	157.315	157.688	158.061	158.435	158.808	159.180	159.553	159.926	160.298	160.671	161.043	150	
160	161.043	161.415	161.787	162.159	162.531	162.903	163.274	163.646	164.017	164.388	164.760	160	
170	164.760	165.131	165.501	165.872	166.243	166.614	166.984	167.354	167.724	168.095	168.465	170	
180	168.465	168.834	169.204	169.574	169.943	170.313	170.682	171.051	171.420	171.789	172.158	180	
190	172.158	172.527	172.895	173.264	173.632	174.000	174.368	174.736	175.104	175.472	175.840	190	
200	175.840	176.207	176.575	176.942	177.309	177.676	178.043	178.410	178.777	179.143	179.510	200	
210	179.510	179.876	180.242	180.609	180.975	181.340	181.706	182.072	182.438	182.803	183.168	210	
220	183.168	183.533	183.899	184.264	184.628	184.993	185.358	185.722	186.087	186.451	186.815	220	
230	186.815	187.179	187.543	187.907	188.271	188.634	188.998	189.361	189.724	190.088	190.451	230	
240	190.451	190.813	191.176	191.539	191.901	192.264	192.626	192.988	193.350	193.712	194.074	240	
250	194.074	194.436	194.798	195.159	195.520	195.882	196.243	196.604	196.965	197.326	197.686	250	
260	197.686	198.047	198.407	198.768	199.128	199.488	199.848	200.208	200.568	200.927	201.287	260	
270	201.287	201.646	202.006	202.365	202.724	203.083	203.442	203.800	204.159	204.517	204.876	270	
280	204.876	205.234	205.592	205.950	206.308	206.666	207.024	207.381	207.739	208.096	208.453	280	
290	208.453	208.810	209.167	209.524	209.881	210.237	210.594	210.950	211.307	211.663	212.019	290	
300	212.019	212.375	212.731	213.086	213.442	213.797	214.153	214.508	214.863	215.218	215.573	300	
310	215.573	215.928	216.282	216.637	216.991	217.346	217.700	218.054	218.408	218.762	219.115	310	
320	219.115	219.469	219.823	220.176	220.529	220.882	221.235	221.588	221.941	222.294	222.646	320	
330	222.646	222.999	223.351	223.703	224.055	224.407	224.759	225.111	225.463	225.814	226.166	330	
340	226.166	226.517	226.868	227.219	227.570	227.921	228.272	228.622	228.973	229.323	229.673	340	
350	229.673	230.023	230.373	230.723	231.073	231.423	231.772	232.122	232.471	232.820	233.169	350	
360	233.169	233.518	233.867	234.216	234.565	234.913	235.261	235.610	235.958	236.306	236.654	360	
370	236.654	237.002	237.349	237.697	238.044	238.392	238.739	239.086	239.433	239.780	240.127	370	
380	240.127	240.473	240.820	241.166	241.513	241.859	242.205	242.551	242.897	243.242	243.588	380	
390	243.588	243.933	244.279	244.624	244.969	245.314	245.659	246.004	246.349	246.693	247.038	390	
400	247.038	247.382	247.726	248.070	248.414	248.758	249.102	249.445	249.789	250.132	250.476	400	
410	250.476	250.819	251.162	251.505	251.848	252.190	252.533	252.875	253.218	253.560	253.902	410	
420	253.902	254.244	254.586	254.928	255.269	255.611	255.952	256.294	256.635	256.976	257.317	420	
430	257.317	257.658	257.999	258.339	258.680	259.020	259.360	259.700	260.040	260.380	260.720	430	
440	260.720	261.060	261.399	261.739	262.078	262.417	262.757	263.096	263.434	263.773	264.112	440	
450	264.112	264.450	264.789	265.127	265.465	265.803	266.141	266.479	266.817	267.154	267.492	450	
460	267.492	267.829	268.167	268.504	268.841	269.178	269.514	269.851	270.188	270.524	270.860	460	
470	270.860	271.197	271.533	271.869	272.204	272.540	272.876	273.211	273.547	273.882	274.217	470	
480	274.217	274.552	274.887	275.222	275.557	275.891	276.226	276.560	276.894	277.228	277.562	480	
490	277.562	277.896	278.230	278.564	278.897	279.231	279.564	279.897	280.230	280.563	280.896	490	
500	280.896	281.229	281.561	281.894	282.226	282.558	282.891	283.223	283.555	283.886	284.218	500	
510	284.218	284.550	284.881	285.212	285.544	285.875	286.206	286.537	286.867	287.198	287.528	510	
520	287.528	287.859	288.189	288.519	288.849	289.179	289.509	289.839	290.168	290.498	290.827	520	
530	290.827	291.157	291.486	291.815	292.144	292.472	292.801	293.130	293.458	293.786	294.114	530	
540	294.114	294.443	294.771	295.098	295.426	295.754	296.081	296.409	296.736	297.063	297.390	540	
DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C	

TABLE 18 100 Ohm Platinum RTD Continued
DIN 43760 (10/80) Curve

Resistance in Ohms												Temperature in Degrees Celsius	
DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C	
550	297.390	297.717	298.044	298.370	298.697	299.024	299.350	299.676	300.002	300.328	300.654	550	
560	300.654	300.980	301.305	301.631	301.956	302.282	302.607	302.932	303.257	303.582	303.906	560	
570	303.906	304.231	304.556	304.880	305.204	305.528	305.852	306.176	306.500	306.824	307.147	570	
580	307.147	307.471	307.794	308.117	308.440	308.763	309.086	309.409	309.732	310.054	310.376	580	
590	310.376	310.699	311.021	311.343	311.665	311.987	312.308	312.630	312.951	313.273	313.594	590	
600	313.594	313.915	314.236	314.557	314.878	315.198	315.519	315.839	316.160	316.480	316.800	600	
610	316.800	317.120	317.440	317.760	318.079	318.399	318.718	319.037	319.356	319.675	319.994	610	
620	319.994	320.313	320.632	320.950	321.269	321.587	321.905	322.224	322.542	322.859	323.177	620	
630	323.177	323.495	323.812	324.130	324.447	324.764	325.081	325.398	325.715	326.032	326.348	630	
640	326.348	326.665	326.981	327.297	327.614	327.930	328.245	328.561	328.877	329.192	329.508	640	
650	329.508	329.823	330.138	330.453	330.768	331.083	331.398	331.713	332.027	332.342	332.656	650	
660	332.656	332.970	333.284	333.598	333.912	334.225	334.539	334.852	335.166	335.479	335.792	660	
670	335.792	336.105	336.418	336.731	337.043	337.356	337.668	337.981	338.293	338.605	338.917	670	
680	338.917	339.229	339.540	339.852	340.164	340.475	340.786	341.097	341.408	341.719	342.030	680	
690	342.030	342.341	342.651	342.962	343.272	343.582	343.892	344.202	344.512	344.822	345.132	690	
700	345.132	345.441	345.751	346.060	346.369	346.678	346.987	347.296	347.605	347.913	348.222	700	
710	348.222	348.530	348.838	349.146	349.454	349.762	350.070	350.378	350.685	350.993	351.300	710	
720	351.300	351.607	351.914	352.221	352.528	352.835	353.141	353.448	353.754	354.060	354.367	720	
730	354.367	354.673	354.979	355.284	355.590	355.896	356.201	356.506	356.812	357.117	357.422	730	
740	357.422	357.727	358.031	358.336	358.641	358.945	359.249	359.553	359.857	360.161	360.465	740	
750	360.465	360.769	361.073	361.376	361.679	361.983	362.286	362.589	362.892	363.195	363.497	750	
760	363.497	363.800	364.102	364.404	364.707	365.009	365.311	365.613	365.914	366.216	366.517	760	
770	366.517	366.819	367.120	367.421	367.722	368.023	368.324	368.625	368.925	369.226	369.526	770	
780	369.526	369.826	370.127	370.427	370.726	371.026	371.326	371.625	371.925	372.224	372.523	780	
790	372.523	372.822	373.121	373.420	373.719	374.018	374.316	374.614	374.913	375.211	375.509	790	
800	375.509	375.807	376.105	376.402	376.700	376.997	377.295	377.592	377.889	378.186	378.483	800	
810	378.483	378.779	379.076	379.373	379.669	379.965	380.261	380.558	380.853	381.149	381.445	810	
820	381.445	381.741	382.036	382.331	382.627	382.922	383.217	383.512	383.806	384.101	384.396	820	
830	384.396	384.690	384.984	385.279	385.573	385.867	386.161	386.454	386.748	387.041	387.335	830	
840	387.335	387.628	387.921	388.214	388.507	388.800	389.093	389.385	389.678	389.970	390.262	840	
DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C	

TABLE 19 110 Ohm Nickel RTD
7 NA Curve

Resistance in Ohms												Temperature in Degrees Fahrenheit	
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F	
-160	60.83											-160	
-150	63.25	63.01	62.77	62.52	62.28	62.04	61.80	61.56	61.31	61.07	60.83	-150	
-140	65.67	65.43	65.19	64.94	64.70	64.46	64.22	63.98	63.73	63.49	63.25	-140	
-130	68.09	67.85	67.61	67.36	67.12	66.88	66.64	66.40	66.15	65.91	65.67	-130	
-120	70.51	70.27	70.03	69.78	69.54	69.30	69.06	68.82	68.57	68.33	68.09	-120	
-110	72.94	72.70	72.45	72.21	71.97	71.72	71.48	71.24	70.99	70.75	70.51	-110	
-100	75.37	75.13	74.88	74.64	74.40	74.15	73.91	73.67	73.43	73.18	72.94	-100	
-90	77.81	77.57	77.32	77.08	76.83	76.59	76.34	76.10	75.86	75.61	75.37	-90	
-80	80.28	80.03	79.78	79.54	79.29	79.04	78.79	78.55	78.30	78.06	77.81	-80	
-70	82.76	82.51	82.26	82.01	81.77	81.52	81.27	81.02	80.77	80.53	80.28	-70	
-60	85.28	85.03	84.77	84.52	84.27	84.01	83.76	83.51	83.26	83.01	82.76	-60	
-50	87.82	87.56	87.31	87.06	86.80	86.55	86.29	86.04	85.79	85.53	85.28	-50	
-40	90.40	90.14	89.88	89.62	89.36	89.10	88.85	88.59	88.33	88.08	87.82	-40	
-30	93.01	92.75	92.49	92.22	91.96	91.70	91.44	91.18	90.92	90.66	90.40	-30	
-20	95.67	95.40	95.13	94.87	94.60	94.33	94.07	93.80	93.54	93.27	93.01	-20	
-10	98.36	98.09	97.82	97.55	97.28	97.01	96.74	96.47	96.21	95.94	95.67	-10	
-0	101.09	100.81	100.54	100.27	99.99	99.72	99.45	99.17	98.90	98.63	98.36	-0	
0	101.09	101.36	101.64	101.92	102.19	102.47	102.75	103.02	103.30	103.58	103.86	0	
10	103.86	104.14	104.42	104.70	104.98	105.26	105.54	105.82	106.10	106.39	106.67	10	
20	106.67	106.95	107.24	107.52	107.80	108.09	108.37	108.66	108.95	109.23	109.52	20	
30	109.52	109.81	110.09	110.38	110.67	110.96	111.25	111.54	111.83	112.12	112.41	30	
40	112.41	112.70	112.99	113.29	113.58	113.87	114.17	114.46	114.76	115.05	115.35	40	
50	115.35	115.64	115.94	116.24	116.53	116.83	117.12	117.42	117.72	118.01	118.31	50	
60	118.31	118.61	118.91	119.21	119.50	119.80	120.10	120.41	120.71	121.01	121.31	60	
70	121.31	121.61	121.91	122.22	122.52	122.82	123.13	123.43	123.74	124.04	124.35	70	
80	124.35	124.66	124.96	125.27	125.58	125.89	126.20	126.51	126.82	127.13	127.44	80	
90	127.44	127.75	128.06	128.37	128.68	129.00	129.31	129.62	129.93	130.25	130.56	90	
100	130.56	130.87	131.19	131.50	131.82	132.13	132.45	132.76	133.08	133.39	133.71	100	
110	133.71	134.03	134.35	134.66	134.98	135.30	135.62	135.94	136.27	136.59	136.91	110	
120	136.91	137.23	137.56	137.88	138.21	138.54	138.86	139.19	139.52	139.85	140.18	120	
130	140.18	140.51	140.84	141.16	141.49	141.82	142.15	142.48	142.81	143.14	143.47	130	
140	143.47	143.80	144.13	144.46	144.80	145.13	145.46	145.80	146.13	146.46	146.80	140	
150	146.80	147.13	147.47	147.80	148.14	148.48	148.81	149.15	149.49	149.82	150.16	150	
160	150.16	150.50	150.84	151.18	151.51	151.85	152.19	152.54	152.88	153.22	153.56	160	
170	153.56	153.90	154.25	154.60	154.94	155.29	155.64	155.99	156.34	156.69	157.04	170	
180	157.04	157.39	157.74	158.09	158.45	158.80	159.15	159.51	159.86	160.21	160.57	180	
190	160.57	160.92	161.28	161.63	161.98	162.34	162.69	163.05	163.40	163.76	164.11	190	
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F	

TABLE 19 110 Ohm Nickel RTD Continued
7 NA Curve

Resistance in Ohms												Temperature in Degrees Fahrenheit	
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F	
200	164.11	164.47	164.83	165.19	165.55	165.91	166.27	166.63	166.99	167.36	167.72	200	
210	167.72	168.08	168.45	168.81	169.17	169.54	169.90	170.26	170.63	170.99	171.36	210	
220	171.36	171.73	172.09	172.46	172.83	173.19	173.56	173.93	174.30	174.67	175.04	220	
230	175.04	175.41	175.78	176.16	176.53	176.91	177.28	177.66	178.03	178.41	178.79	230	
240	178.79	179.17	179.55	179.93	180.31	180.69	181.07	181.45	181.83	182.22	182.60	240	
250	182.60	182.98	183.37	183.75	184.14	184.52	184.91	185.30	185.68	186.07	186.46	250	
260	186.46	186.85	187.24	187.63	188.02	188.41	188.80	189.20	189.59	189.98	190.38	260	
270	190.38	190.77	191.17	191.56	191.96	192.35	192.75	193.15	193.54	193.94	194.34	270	
280	194.34	194.74	195.14	195.54	195.94	196.34	196.74	197.15	197.55	197.95	198.36	280	
290	198.36	198.76	199.17	199.58	199.98	200.39	200.80	201.20	201.61	202.02	202.43	290	
300	202.43	202.84	203.25	203.66	204.08	204.49	204.91	205.32	205.74	206.15	206.57	300	
310	206.57	206.99	207.40	207.82	208.24	208.66	209.08	209.50	209.92	210.35	210.77	310	
320	210.77	211.19	211.61	212.04	212.46	212.88	213.30	213.73	214.15	214.58	215.00	320	
330	215.00	215.43	215.86	216.28	216.71	217.14	217.58	218.01	218.44	218.87	219.31	330	
340	219.31	219.74	220.18	220.61	221.05	221.49	221.92	222.36	222.80	223.24	223.68	340	
350	223.68	224.12	224.56	225.00	225.44	225.89	226.33	226.77	227.22	227.66	228.11	350	
360	228.11	228.56	229.00	229.45	229.90	230.35	230.80	231.25	231.70	232.15	232.60	360	
370	232.60	233.05	233.51	233.96	234.42	234.87	235.33	235.78	236.24	236.70	237.16	370	
380	237.16	237.62	238.08	238.54	239.00	239.46	239.92	240.39	240.85	241.31	241.78	380	
390	241.78	242.24	242.71	243.18	243.64	244.11	244.58	245.05	245.52	245.99	246.46	390	
400	246.46	246.93	247.40	247.87	248.35	248.82	249.29	249.77	250.24	250.71	251.19	400	
410	251.19	251.67	252.15	252.62	253.10	253.58	254.01	254.55	255.03	255.51	256.00	410	
420	256.00	256.48	256.97	257.46	257.95	258.43	258.92	259.41	259.91	260.40	260.89	420	
430	260.89	261.38	261.88	262.37	262.87	263.36	263.86	264.35	264.85	265.35	265.85	430	
440	265.85	266.35	266.85	267.36	267.86	268.36	268.87	269.38	269.88	270.39	270.90	440	
450	270.90	271.41	271.92	272.43	272.94	273.46	273.97	274.49	275.00	275.52	276.04	450	
460	276.04	276.56	277.08	277.60	278.12	278.64	279.16	279.68	280.20	280.73	281.25	460	
470	281.25	281.77	282.30	282.83	283.36	283.88	284.41	284.94	285.48	286.01	286.54	470	
480	286.54	287.07	287.61	288.14	288.68	289.21	289.75	290.29	290.83	291.37	291.91	480	
490	291.91	292.45	292.99	293.53	294.08	294.62	295.17	295.71	296.26	296.80	297.35	490	
500	297.35	297.90	298.45	299.00	299.55	300.10	300.66	301.21	301.77	302.32	302.88	500	
510	302.88	303.44	304.00	304.56	305.12	305.68	306.24	306.80	307.37	307.93	308.50	510	
520	308.50	309.07	309.64	310.21	310.78	311.35	311.93	312.50	313.08	313.66	314.24	520	
530	314.24	314.82	315.40	315.98	316.57	317.15	317.74	318.32	318.91	319.50	320.09	530	
540	320.09	320.68	321.27	321.86	322.45	323.05	323.64	324.24	324.83	325.43	326.03	540	
550	326.03	326.63	327.23	327.83	328.44	329.04	329.65	330.25	330.86	331.471	332.08	550	
560	332.08	332.69	333.30	333.92	334.53	335.15	335.77	336.39	337.01	337.63	338.25	560	
570	338.25	338.87	339.50	340.13	340.76	341.39	342.02	342.65	343.29	343.92	344.56	570	
580	344.56	345.20	345.84	346.48	347.13	347.77	348.42	349.07	349.72	350.37	351.02	580	
590	351.02	351.67	352.33	352.99	353.65	354.31	354.97	355.63	356.30	356.96	357.63	590	
600	357.63											600	

TABLE 20 110 Ohm Nickel RTD
7 NA Curve

Resistance in Ohms												Temperature in Degrees Celsius	
DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C	
-100	63.73	63.29	62.86	62.42	61.99	61.55						-100	
- 90	68.09	67.65	67.22	66.78	66.35	65.91	65.47	65.04	64.60	64.17	63.73	- 90	
- 80	72.45	72.01	71.58	71.14	70.71	70.27	69.83	69.40	68.96	68.53	68.09	- 80	
- 70	76.83	76.39	75.95	75.51	75.08	74.64	74.20	73.76	73.32	72.89	72.45	- 70	
- 60	81.27	80.82	80.38	79.93	79.49	79.04	78.60	78.16	77.71	77.27	76.83	- 60	
- 50	85.79	85.33	84.88	84.43	83.97	83.52	83.07	82.62	82.17	81.72	81.27	- 50	
- 40	90.40	89.93	89.47	89.01	88.54	88.08	87.62	87.16	86.70	86.25	85.79	- 40	
- 30	95.14	94.67	94.18	93.70	93.23	92.75	92.28	91.81	91.34	90.87	90.40	- 30	
- 20	100.00	99.51	99.02	98.53	98.04	97.55	97.07	96.59	96.10	95.62	95.14	- 20	
- 10	104.98	104.48	103.97	103.47	102.97	102.47	101.98	101.48	100.99	100.49	100.00	- 10	
- 0	110.10	109.58	109.06	108.55	108.03	107.52	107.01	106.50	105.99	105.49	104.98	- 0	
0	110.10	110.62	111.14	111.66	112.18	112.71	113.23	113.76	114.29	114.82	115.35	0	
10	115.35	115.88	116.41	116.95	117.48	118.02	118.55	119.09	119.63	120.17	120.71	10	
20	120.71	121.25	121.80	122.34	122.89	123.44	123.99	124.54	125.09	125.64	126.20	20	
30	126.20	126.76	127.31	127.87	128.43	128.99	129.56	130.12	130.69	131.25	131.82	30	
40	131.82	132.39	132.96	133.53	134.11	134.69	135.26	135.84	136.42	137.01	137.59	40	
50	137.59	138.17	138.76	139.34	139.93	140.52	141.10	141.69	142.28	142.88	143.47	50	
60	143.47	144.07	144.66	145.26	145.86	146.46	147.06	147.67	148.27	148.88	149.49	60	
70	149.49	150.10	150.71	151.32	151.94	152.55	153.17	153.79	154.41	155.03	155.65	70	
80	155.65	156.28	156.90	157.53	158.16	158.80	159.43	160.07	160.71	161.35	161.99	80	
90	161.99	162.63	163.27	163.91	164.56	165.20	165.85	166.49	167.14	167.79	168.44	90	
100	168.44	169.09	169.75	170.40	171.06	171.72	172.38	173.04	173.71	174.37	175.04	100	
110	175.04	175.71	176.38	177.06	177.74	178.41	179.10	179.78	180.46	181.15	181.84	110	
120	181.84	182.53	183.22	183.91	184.61	185.30	186.00	186.70	187.40	188.10	188.81	120	
130	188.81	189.52	190.22	190.93	191.65	192.36	193.07	193.79	194.51	195.23	195.95	130	
140	195.95	196.67	197.40	198.12	198.85	199.58	200.32	201.05	201.78	202.52	203.26	140	
150	203.26	204.00	204.74	205.49	206.23	206.98	207.73	208.48	209.24	209.99	210.75	150	
160	210.75	211.51	212.27	213.04	213.80	214.57	215.34	216.12	216.89	217.67	218.45	160	
170	218.45	219.23	220.01	220.80	221.59	222.37	223.17	223.96	224.75	225.55	226.35	170	
180	226.35	227.15	227.95	228.75	229.56	230.36	231.17	231.98	232.79	233.60	234.42	180	
190	234.42	235.24	236.06	236.87	237.71	238.54	239.37	240.21	241.04	241.88	242.72	190	
200	242.72	243.56	244.40	245.24	246.09	246.93	247.78	248.63	249.48	250.33	251.19	200	
210	251.19	252.05	252.91	253.78	254.65	255.52	256.39	257.27	258.15	259.03	259.91	210	
220	259.91	260.80	261.68	262.57	263.47	264.36	265.26	266.16	267.07	267.97	268.88	220	
230	268.88	269.79	270.71	271.62	272.54	273.47	274.39	275.32	276.25	277.18	278.12	230	
240	278.12	279.06	280.00	280.94	281.89	282.83	283.78	284.74	285.69	286.65	287.61	240	
250	287.61	288.57	289.54	290.51	291.48	292.45	293.42	294.40	295.38	296.36	297.35	250	
260	297.35	298.34	299.33	300.33	301.32	302.32	303.33	304.33	305.34	306.35	307.37	260	
270	307.37	308.39	309.42	310.45	311.48	312.51	313.55	314.60	315.64	316.70	317.75	270	
280	317.75	318.80	319.86	320.93	321.99	323.06	324.13	325.21	326.28	327.37	328.45	280	
290	328.45	329.54	330.63	331.73	332.83	333.93	335.04	336.15	337.27	338.39	339.51	290	
300	339.51	340.64	341.78	342.92	344.06	345.21	346.36	347.52	348.68	349.85	351.02	300	
DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C	

TABLE 21 9.042 Ohm Copper RTD
SAMA Standard Curve

Resistance in Ohms							Temperature in Degrees Fahrenheit						
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F	
-100	6.202	6.180	6.159	6.137	6.115	6.093	6.072	6.050	6.028	6.006	5.984	-100	
-90	6.419	6.398	6.376	6.354	6.332	6.311	6.289	6.267	6.246	6.224	6.202	-90	
-80	6.636	6.615	6.593	6.571	6.550	6.528	6.506	6.484	6.463	6.441	6.419	-80	
-70	6.853	6.831	6.809	6.788	6.766	6.744	6.723	6.701	6.680	6.658	6.636	-70	
-60	7.069	7.047	7.026	7.004	6.982	6.961	6.939	6.918	6.896	6.874	6.853	-60	
-50	7.285	7.263	7.241	7.220	7.198	7.177	7.155	7.134	7.112	7.090	7.069	-50	
-40	7.500	7.478	7.457	7.435	7.414	7.392	7.371	7.349	7.328	7.306	7.285	-40	
-30	7.715	7.694	7.672	7.651	7.629	7.608	7.586	7.565	7.543	7.521	7.500	-30	
-20	7.930	7.908	7.887	7.865	7.844	7.823	7.801	7.780	7.758	7.737	7.715	-20	
-10	8.144	8.123	8.102	8.080	8.059	8.037	8.016	7.994	7.973	7.951	7.930	-10	
0	8.358	8.337	8.316	8.294	8.273	8.252	8.230	8.209	8.187	8.166	8.144	0	
10	8.358	8.379	8.401	8.422	8.444	8.465	8.486	8.508	8.529	8.551	8.572	10	
20	8.572	8.593	8.615	8.636	8.658	8.679	8.700	8.722	8.743	8.765	8.786	20	
30	8.786	8.807	8.829	8.850	8.872	8.893	8.914	8.936	8.957	8.979	9.000	30	
40	9.000	9.021	9.043	9.064	9.086	9.107	9.128	9.150	9.171	9.193	9.214	40	
50	9.214	9.235	9.257	9.278	9.300	9.321	9.342	9.364	9.385	9.407	9.428	50	
60	9.428	9.449	9.471	9.492	9.514	9.535	9.556	9.578	9.599	9.621	9.642	60	
70	9.642	9.663	9.685	9.706	9.728	9.749	9.770	9.792	9.813	9.835	9.856	70	
80	9.856	9.877	9.899	9.920	9.942	9.963	9.984	10.006	10.027	10.049	10.070	80	
90	10.070	10.091	10.113	10.134	10.156	10.177	10.198	10.220	10.241	10.263	10.284	90	
100	10.284	10.305	10.327	10.348	10.370	10.391	10.412	10.434	10.455	10.477	10.498	100	
110	10.498	10.519	10.541	10.562	10.584	10.605	10.626	10.648	10.669	10.691	10.712	110	
120	10.712	10.733	10.755	10.776	10.798	10.819	10.840	10.862	10.883	10.905	10.926	120	
130	10.926	10.947	10.969	10.990	11.012	11.033	11.054	11.076	11.097	11.119	11.140	130	
140	11.140	11.161	11.183	11.204	11.226	11.247	11.268	11.290	11.311	11.333	11.354	140	
150	11.354	11.375	11.397	11.418	11.440	11.461	11.482	11.504	11.525	11.547	11.568	150	
160	11.568	11.589	11.611	11.632	11.654	11.675	11.696	11.718	11.739	11.761	11.782	160	
170	11.782	11.803	11.825	11.846	11.868	11.889	11.910	11.932	11.953	11.975	11.996	170	
180	11.996	12.017	12.039	12.060	12.082	12.103	12.124	12.146	12.167	12.189	12.210	180	
190	12.210	12.231	12.253	12.274	12.296	12.317	12.338	12.360	12.381	12.403	12.424	190	
190	12.424	12.445	12.467	12.488	12.510	12.531	12.552	12.574	12.595	12.617	12.638	190	
200	12.638	12.659	12.681	12.702	12.724	12.745	12.766	12.788	12.809	12.831	12.852	200	
210	12.852	12.873	12.895	12.916	12.938	12.959	12.980	13.002	13.023	13.045	13.066	210	
220	13.066	13.087	13.109	13.130	13.152	13.173	13.194	13.216	13.237	13.259	13.280	220	
230	13.280	13.301	13.323	13.344	13.366	13.387	13.408	13.430	13.451	13.473	13.494	230	
240	13.494	13.515	13.537	13.558	13.580	13.601	13.622	13.644	13.665	13.687	13.708	240	
250	13.708	13.729	13.751	13.772	13.794	13.815	13.836	13.858	13.879	13.901	13.922	250	
260	13.922	13.943	13.965	13.986	14.008	14.029	14.050	14.072	14.093	14.115	14.136	260	
270	14.136	14.157	14.179	14.200	14.222	14.243	14.264	14.286	14.307	14.329	14.350	270	
280	14.350	14.371	14.393	14.414	14.436	14.457	14.478	14.500	14.521	14.543	14.564	280	
290	14.564	14.585	14.607	14.628	14.650	14.671	14.692	14.714	14.735	14.757	14.778	290	
300	14.778	14.799	14.821	14.842	14.864	14.885	14.906	14.928	14.949	14.971	14.992	300	
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F	

TABLE 22 9.042 Ohm Copper RTD
SAMA Standard Curve

Resistance in Ohms												Temperature in Degrees Celsius	
DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C	
-70	6.331	6.292	6.253	6.214	6.175	6.136	6.097	6.057	6.018	5.979	5.940	-70	
-60	6.722	6.683	6.644	6.605	6.566	6.527	6.488	6.449	6.410	6.370	6.331	-60	
-50	7.111	7.072	7.033	6.994	6.955	6.916	6.878	6.839	6.800	6.761	6.722	-50	
-40	7.499	7.460	7.421	7.383	7.344	7.305	7.266	7.227	7.189	7.150	7.111	-40	
-30	7.886	7.847	7.809	7.770	7.731	7.693	7.654	7.615	7.576	7.538	7.499	-30	
-20	8.272	8.234	8.195	8.156	8.118	8.079	8.041	8.002	7.963	7.925	7.886	-20	
-10	8.657	8.619	8.580	8.542	8.503	8.465	8.426	8.388	8.349	8.311	8.272	-10	
0	9.042	9.004	8.965	8.927	8.888	8.850	8.811	8.773	8.734	8.696	8.657	0	
0	9.042	9.081	9.119	9.158	9.196	9.235	9.273	9.312	9.350	9.389	9.427	0	
10	9.427	9.466	9.504	9.543	9.581	9.620	9.658	9.697	9.735	9.774	9.812	10	
20	9.812	9.851	9.889	9.928	9.966	10.005	10.044	10.082	10.121	10.159	10.198	20	
30	10.198	10.236	10.275	10.313	10.352	10.390	10.429	10.467	10.506	10.544	10.583	30	
40	10.583	10.621	10.660	10.698	10.737	10.775	10.814	10.852	10.891	10.929	10.968	40	
50	10.968	11.007	11.045	11.084	11.122	11.161	11.199	11.238	11.276	11.315	11.353	50	
60	11.353	11.392	11.430	11.469	11.507	11.546	11.584	11.623	11.661	11.700	11.738	60	
70	11.738	11.777	11.815	11.854	11.892	11.931	11.970	12.008	12.047	12.085	12.124	70	
80	12.124	12.162	12.201	12.239	12.278	12.316	12.355	12.393	12.432	12.470	12.509	80	
90	12.509	12.547	12.586	12.624	12.663	12.701	12.740	12.778	12.817	12.855	12.894	90	
100	12.894	12.933	12.971	13.010	13.048	13.087	13.125	13.164	13.202	13.241	13.279	100	
110	13.279	13.318	13.356	13.395	13.433	13.472	13.510	13.549	13.587	13.626	13.664	110	
120	13.664	13.703	13.741	13.780	13.818	13.857	13.896	13.934	13.973	14.011	14.050	120	
130	14.050	14.088	14.127	14.165	14.204	14.242	14.281	14.319	14.358	14.396	14.435	130	
140	14.435	14.473	14.512	14.550	14.589	14.627	14.666	14.704	14.743	14.781	14.820	140	
150	14.820	14.859	14.897	14.936	14.974	15.013	15.051	15.090	15.128	15.167	15.205	150	
DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C	

TABLE 23 9.035 Ohm Copper RTD
 MINCO 17-9

 Resistance in Ohms Temperature in Degrees Fahrenheit

DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F
-310	1.472	1.449	1.426	1.403	1.380	1.357	1.334	1.311	1.288	1.265	1.242	-310
-300	1.701	1.678	1.655	1.632	1.609	1.587	1.564	1.541	1.518	1.495	1.472	-300
-290	1.930	1.907	1.884	1.861	1.839	1.816	1.793	1.770	1.747	1.724	1.701	-290
-280	2.158	2.136	2.113	2.090	2.067	2.044	2.021	1.999	1.976	1.953	1.930	-280
-270	2.386	2.364	2.341	2.318	2.295	2.272	2.250	2.227	2.204	2.181	2.158	-270
-260	2.614	2.591	2.568	2.546	2.523	2.500	2.477	2.455	2.432	2.409	2.386	-260
-250	2.841	2.818	2.795	2.773	2.750	2.727	2.705	2.682	2.659	2.637	2.614	-250
-240	3.067	3.045	3.022	2.999	2.977	2.954	2.931	2.909	2.886	2.863	2.841	-240
-230	3.293	3.271	3.248	3.226	3.203	3.180	3.158	3.135	3.113	3.090	3.067	-230
-220	3.519	3.496	3.474	3.451	3.429	3.406	3.384	3.361	3.338	3.316	3.293	-220
-210	3.744	3.721	3.699	3.676	3.654	3.631	3.609	3.586	3.564	3.541	3.519	-210
-200	3.968	3.946	3.923	3.901	3.879	3.856	3.834	3.811	3.789	3.766	3.744	-200
-190	4.192	4.170	4.148	4.125	4.103	4.080	4.058	4.036	4.013	3.991	3.968	-190
-180	4.416	4.394	4.371	4.349	4.327	4.304	4.282	4.259	4.237	4.215	4.192	-180
-170	4.639	4.617	4.594	4.572	4.550	4.527	4.505	4.483	4.461	4.438	4.416	-170
-160	4.862	4.839	4.817	4.795	4.773	4.750	4.728	4.706	4.684	4.661	4.639	-160
-150	5.084	5.061	5.039	5.017	4.995	4.973	4.950	4.928	4.906	4.884	4.862	-150
-140	5.305	5.283	5.261	5.239	5.217	5.194	5.172	5.150	5.128	5.106	5.084	-140
-130	5.526	5.504	5.482	5.460	5.438	5.416	5.394	5.372	5.350	5.327	5.305	-130
-120	5.747	5.725	5.703	5.681	5.659	5.637	5.615	5.593	5.571	5.548	5.526	-120
-110	5.967	5.945	5.923	5.901	5.879	5.857	5.835	5.813	5.791	5.769	5.747	-110
-100	6.187	6.165	6.143	6.121	6.099	6.077	6.055	6.033	6.011	5.989	5.967	-100
-90	6.406	6.384	6.362	6.340	6.318	6.296	6.275	6.253	6.231	6.209	6.187	-90
-80	6.625	6.603	6.581	6.559	6.537	6.515	6.494	6.472	6.450	6.428	6.406	-80
-70	6.843	6.821	6.799	6.777	6.756	6.734	6.712	6.690	6.668	6.647	6.625	-70
-60	7.061	7.039	7.017	6.995	6.974	6.952	6.930	6.908	6.886	6.865	6.843	-60
-50	7.276	7.254	7.233	7.211	7.190	7.168	7.147	7.126	7.104	7.082	7.061	-50
-40	7.490	7.469	7.447	7.425	7.404	7.383	7.362	7.340	7.319	7.297	7.276	-40
-30	7.705	7.683	7.662	7.640	7.619	7.598	7.576	7.555	7.533	7.512	7.490	-30
-20	7.919	7.898	7.876	7.855	7.834	7.812	7.791	7.769	7.748	7.726	7.705	-20
-10	8.134	8.112	8.091	8.070	8.048	8.027	8.005	7.984	7.962	7.941	7.919	-10
0	8.348	8.327	8.306	8.284	8.263	8.241	8.220	8.198	8.177	8.155	8.134	0
0	8.348	8.370	8.391	8.413	8.434	8.456	8.477	8.499	8.520	8.542	8.563	0
10	8.563	8.584	8.606	8.627	8.649	8.670	8.692	8.713	8.735	8.756	8.778	10
20	8.778	8.799	8.820	8.842	8.863	8.885	8.906	8.928	8.949	8.971	8.992	20
30	8.992	9.014	9.035	9.056	9.078	9.099	9.121	9.142	9.164	9.185	9.207	30
40	9.207	9.228	9.250	9.271	9.292	9.314	9.335	9.357	9.378	9.400	9.421	40

 DEG F DEG F

TABLE 23 9.035 Ohm Copper RTD Continued
MINCO 17-9

Resistance in Ohms												Temperature in Degrees Fahrenheit	
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F	
50	9.421	9.443	9.464	9.486	9.507	9.528	9.550	9.571	9.593	9.614	9.636	50	
60	9.636	9.657	9.679	9.700	9.722	9.743	9.764	9.786	9.807	9.829	9.850	60	
70	9.850	9.872	9.893	9.915	9.936	9.958	9.979	10.000	10.022	10.043	10.065	70	
80	10.065	10.086	10.108	10.129	10.151	10.172	10.194	10.215	10.236	10.258	10.279	80	
90	10.279	10.301	10.322	10.344	10.365	10.387	10.408	10.430	10.451	10.472	10.494	90	
100	10.494	10.515	10.537	10.558	10.580	10.601	10.623	10.644	10.666	10.687	10.708	100	
110	10.708	10.730	10.751	10.773	10.794	10.816	10.837	10.859	10.880	10.902	10.923	110	
120	10.923	10.944	10.966	10.987	11.009	11.030	11.052	11.073	11.095	11.116	11.138	120	
130	11.138	11.159	11.180	11.202	11.223	11.245	11.266	11.288	11.309	11.331	11.352	130	
140	11.352	11.374	11.395	11.416	11.438	11.459	11.481	11.502	11.524	11.545	11.567	140	
150	11.567	11.588	11.610	11.631	11.652	11.674	11.695	11.717	11.738	11.760	11.781	150	
160	11.781	11.803	11.824	11.846	11.867	11.888	11.910	11.931	11.953	11.974	11.996	160	
170	11.996	12.017	12.039	12.060	12.082	12.103	12.124	12.146	12.167	12.189	12.210	170	
180	12.210	12.232	12.253	12.275	12.296	12.318	12.339	12.360	12.382	12.403	12.425	180	
190	12.425	12.446	12.468	12.489	12.511	12.532	12.554	12.575	12.596	12.618	12.639	190	
200	12.639	12.661	12.682	12.704	12.725	12.747	12.768	12.790	12.811	12.832	12.854	200	
210	12.854	12.875	12.897	12.918	12.940	12.961	12.983	13.004	13.026	13.047	13.068	210	
220	13.068	13.090	13.111	13.133	13.154	13.176	13.197	13.219	13.240	13.262	13.283	220	
230	13.283	13.304	13.326	13.347	13.369	13.390	13.412	13.433	13.455	13.476	13.498	230	
240	13.498	13.519	13.540	13.562	13.583	13.605	13.626	13.648	13.669	13.691	13.712	240	
250	13.712	13.734	13.755	13.776	13.798	13.819	13.841	13.862	13.884	13.905	13.927	250	
260	13.927	13.948	13.970	13.991	14.012	14.034	14.055	14.077	14.098	14.120	14.141	260	
270	14.141	14.163	14.184	14.206	14.227	14.248	14.270	14.291	14.313	14.334	14.356	270	
280	14.356	14.377	14.399	14.420	14.442	14.463	14.484	14.506	14.527	14.549	14.570	280	
290	14.570	14.592	14.613	14.635	14.656	14.678	14.699	14.720	14.742	14.763	14.785	290	
300	14.785	14.806	14.828	14.849	14.871	14.893	14.914	14.936	14.958	14.979	15.001	300	
310	15.001	15.022	15.044	15.066	15.087	15.109	15.131	15.152	15.174	15.196	15.217	310	
320	15.217	15.239	15.260	15.282	15.304	15.325	15.347	15.369	15.390	15.412	15.434	320	
330	15.434	15.455	15.477	15.499	15.520	15.542	15.563	15.585	15.607	15.628	15.650	330	
340	15.650	15.672	15.693	15.715	15.737	15.758	15.780	15.802	15.823	15.845	15.866	340	
350	15.866	15.888	15.910	15.931	15.953	15.975	15.996	16.018	16.040	16.061	16.083	350	
360	16.083	16.105	16.126	16.148	16.170	16.191	16.213	16.234	16.256	16.278	16.299	360	
370	16.299	16.321	16.343	16.364	16.386	16.408	16.429	16.451	16.473	16.494	16.516	370	
380	16.516	16.538	16.559	16.581	16.603	16.624	16.646	16.667	16.689	16.711	16.732	380	
390	16.732	16.754	16.776	16.797	16.819	16.841	16.862	16.884	16.906	16.927	16.949	390	
400	16.949	16.971	16.992	17.014	17.036	17.057	17.079	17.101	17.122	17.144	17.166	400	
410	17.166	17.187	17.209	17.231	17.252	17.274	17.296	17.317	17.339	17.360	17.382	410	
420	17.382	17.404	17.425	17.447	17.469	17.490	17.512	17.534	17.555	17.577	17.599	420	
430	17.599	17.620	17.642	17.664	17.685	17.707	17.729	17.750	17.772	17.794	17.815	430	
440	17.815	17.837	17.859	17.880	17.902	17.924	17.945	17.967	17.989	18.010	18.032	440	
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F	

TABLE 23 9.035 Ohm Copper RTD Continued
MINCO 17-9

Resistance in Ohms											Temperature in Degrees Fahrenheit	
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F
450	18.032	18.054	18.075	18.097	18.119	18.140	18.162	18.184	18.205	18.227	18.249	450
460	18.249	18.270	18.292	18.314	18.335	18.357	18.379	18.400	18.422	18.444	18.465	460
470	18.465	18.487	18.509	18.530	18.552	18.574	18.595	18.617	18.639	18.661	18.682	470
480	18.682	18.704	18.726	18.747	18.769	18.791	18.812	18.834	18.856	18.877	18.899	480
490	18.899	18.921	18.942	18.964	18.986	19.007	19.029	19.051	19.072	19.094	19.116	490
DEG F	0	1	2	3	4	5	6	7	8	9	10	DEG F

TABLE 24 9.035 Ohm Copper RTD
MINCO 16-9

Resistance in Ohms												Temperature in Degrees Celsius	
DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C	
-190	1.472	1.430	1.389	1.348	1.306	1.265	1.223	1.182	1.141	1.099	1.058	-190	
-180	1.884	1.843	1.802	1.761	1.719	1.678	1.637	1.596	1.554	1.513	1.472	-180	
-170	2.295	2.254	2.213	2.172	2.131	2.090	2.049	2.008	1.967	1.925	1.884	-170	
-160	2.705	2.664	2.623	2.582	2.541	2.500	2.459	2.418	2.377	2.336	2.295	-160	
-150	3.113	3.072	3.031	2.990	2.950	2.909	2.868	2.827	2.786	2.746	2.705	-150	
-140	3.519	3.478	3.438	3.397	3.356	3.316	3.275	3.235	3.194	3.153	3.113	-140	
-130	3.923	3.883	3.843	3.802	3.762	3.721	3.681	3.640	3.600	3.559	3.519	-130	
-120	4.327	4.286	4.246	4.206	4.165	4.125	4.085	4.045	4.004	3.964	3.923	-120	
-110	4.728	4.688	4.648	4.608	4.568	4.527	4.487	4.447	4.407	4.367	4.327	-110	
-100	5.128	5.088	5.048	5.008	4.968	4.928	4.888	4.848	4.808	4.768	4.728	-100	
-90	5.526	5.487	5.447	5.407	5.367	5.327	5.288	5.248	5.208	5.168	5.128	-90	
-80	5.923	5.884	5.844	5.804	5.765	5.725	5.685	5.646	5.606	5.566	5.526	-80	
-70	6.318	6.279	6.239	6.200	6.160	6.121	6.081	6.042	6.002	5.963	5.923	-70	
-60	6.712	6.673	6.633	6.594	6.555	6.515	6.476	6.437	6.397	6.358	6.318	-60	
-50	7.104	7.065	7.026	6.987	6.947	6.908	6.869	6.830	6.791	6.751	6.712	-50	
-40	7.490	7.452	7.413	7.374	7.336	7.297	7.259	7.220	7.181	7.143	7.104	-40	
-30	7.876	7.838	7.799	7.761	7.722	7.683	7.645	7.606	7.568	7.529	7.490	-30	
-20	8.263	8.224	8.185	8.147	8.108	8.070	8.031	7.992	7.954	7.915	7.876	-20	
-10	8.649	8.610	8.572	8.533	8.494	8.456	8.417	8.378	8.340	8.301	8.263	-10	
0	9.035	8.996	8.958	8.919	8.881	8.842	8.803	8.765	8.726	8.687	8.649	0	
0	9.035	9.074	9.112	9.151	9.189	9.228	9.267	9.305	9.344	9.383	9.421	0	
10	9.421	9.460	9.498	9.537	9.576	9.614	9.653	9.692	9.730	9.769	9.807	10	
20	9.807	9.846	9.885	9.923	9.962	10.000	10.039	10.078	10.116	10.155	10.194	20	
30	10.194	10.232	10.271	10.309	10.348	10.387	10.425	10.464	10.502	10.541	10.580	30	
40	10.580	10.618	10.657	10.696	10.734	10.773	10.811	10.850	10.889	10.927	10.966	40	
50	10.996	11.005	11.043	11.082	11.120	11.159	11.198	11.236	11.275	11.313	11.352	50	
60	11.352	11.391	11.429	11.468	11.507	11.545	11.584	11.622	11.661	11.700	11.738	60	
70	11.738	11.777	11.816	11.854	11.893	11.931	11.970	12.009	12.047	12.086	12.124	70	
80	12.124	12.163	12.202	12.240	12.279	12.318	12.356	12.395	12.433	12.472	12.511	80	
90	12.511	12.549	12.588	12.627	12.665	12.704	12.742	12.781	12.820	12.858	12.897	90	
100	12.897	12.935	12.974	13.013	13.051	13.090	13.129	13.167	13.206	13.244	13.283	100	
110	13.283	13.322	13.360	13.399	13.437	13.476	13.515	13.553	13.592	13.631	13.669	110	
120	13.669	13.708	13.746	13.785	13.824	13.862	13.901	13.940	13.978	14.017	14.055	120	
130	14.055	14.094	14.133	14.171	14.210	14.248	14.287	14.326	14.364	14.403	14.442	130	
140	14.442	14.480	14.519	14.557	14.596	14.635	14.673	14.712	14.751	14.789	14.828	140	
150	14.828	14.867	14.906	14.945	14.984	15.022	15.061	15.100	15.139	15.178	15.217	150	
160	15.217	15.256	15.295	15.334	15.373	15.412	15.451	15.490	15.529	15.568	15.607	160	
170	15.607	15.646	15.685	15.724	15.763	15.802	15.840	15.879	15.918	15.957	15.996	170	
180	15.996	16.035	16.074	16.113	16.152	16.191	16.230	16.269	16.308	16.347	16.386	180	
190	16.386	16.425	16.464	16.503	16.542	16.581	16.620	16.659	16.698	16.737	16.776	190	
DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C	

TABLE 24 9.035 Ohm Copper RTD Continued
MINCO 16-9

Resistance in Ohms											Temperature in Degrees Celsius	
DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C
200	16.776	16.815	16.854	16.893	16.932	16.971	17.010	17.049	17.088	17.127	17.166	200
210	17.166	17.205	17.244	17.283	17.321	17.360	17.399	17.438	17.477	17.516	17.555	210
220	17.555	17.594	17.633	17.672	17.711	17.750	17.789	17.828	17.867	17.906	17.945	220
230	17.945	17.984	18.023	18.062	18.101	18.140	18.179	18.218	18.257	18.296	18.335	230
240	18.335	18.374	18.413	18.452	18.491	18.530	18.569	18.608	18.648	18.687	18.726	240
250	18.726	18.765	18.804	18.843	18.882	18.921	18.960	18.999	19.038	19.077	19.116	250
DEG C	0	1	2	3	4	5	6	7	8	9	10	DEG C

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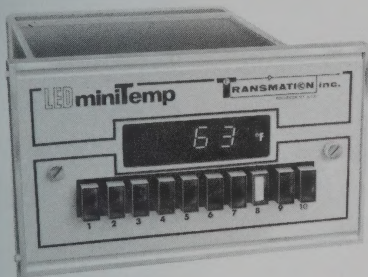
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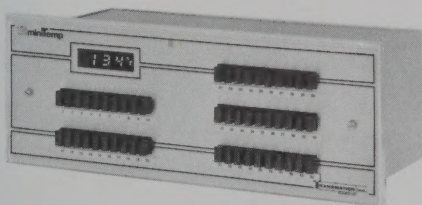
NOTES

MiniTemp® Digital Temperature Indicators



300 Series LED MiniTemp®
with 10 goldplated
pushbutton switches

Add-on 300 Series switch-only
unit with 30 pushbutton switches



50-point unit (800 Series uses
Palladium-contact toggle switches)

Thermocouple models shown. Also available from Transmation: RTD MiniTemp® Series, which accepts inputs from a variety of resistance temperature detectors.

Contact Transmation, Inc. for additional information.

